MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) STORM WATER MANAGEMENT PLAN

PERMIT YEAR 1 REPORT

FROM THE

THE CITY OF BANGOR, MAINE

TO COMPLY WITH
38 M.R.S.A. § 413

Submitted October 23, 2009

EXECUTIVE SUMMARY

In 2003, the U S EPA enacted the Stormwater Phase 2 regulations that mandated six minimum control measures (MCM) for stormwater management be implemented in urbanized areas with populations between 50,000 and 100,000.

The required Minimum Control Measures are:

MCM 1 – Public Education and Outreach

MCM 2 – Public Participation and Involvement

MCM 3 – Illicit Discharge Detection and Elimination

MCM 4 – Construction Site Runoff Control

MCM 5 – Post Construction Runoff Control

MCM 6 – Pollution Prevention/Good Housekeeping in Municipal Operations.

Beginning in 2009, communities with urban impaired streams are also required to implement programs to address the impaired streams in addition to the 6 minimum controls.

The regulated entities in the Bangor Urbanized Area (Bangor, Brewer, Hampden, Veazie, Orono, Old Town, Milford, Maine Air National Guard, University of Maine, University College at Bangor, Dorothea Dix Psychiatric Center, and Eastern Maine Community College) have joined together as the Bangor Area Storm Water Group (BASWG) for the purpose of collaboratively addressing compliance with these requirements.

The State of Maine Department of Environmental Protection enforces the Stormwater Program through a General Permit for Municipal Separate Storm Sewer Systems *MS4).The MS4 General Permit is for 5 years and was recently reissued for the period July 1, 2008 through June 30, 2013.

The MS4 General Permit requires each community to develop and implement an MS4 Stormwater Management Plan and to submit an annual Report to DEP.

This report describes the activities that Bangor has undertaken during Permit Year 1 (July 1 2008 through June 30 2009) to comply with the terms and conditions of Bangor's MS4 Stormwater Management Plan. Minimum Control Measures 1 and 2 were done collaboratively with the BASWG. Portions of other Minimum Control Measures were also done collaboratively, and are so noted in the report.

The Urban Impaired Stream portion, Section 5, reports on a number of activities. It is noted that grant funding played a significant role in the implementation of these activities. Specifically, due to the Federal Government implementation of the American Recovery and Reinvestment Act of 2009, the City received $3,000,000 in SRF Loans, $160,000 in 319 and 604B grant funds. As a result the City will be required to pay back 50% of the SRF loan over time. The City of Bangor expresses its appreciation to the Maine Department of Environmental Protection for its grant fund participation, without which these activities could not have happened. The City would like to underscore, however, that it is highly unlikely that this type of investment will occur every year, since the Federal Government will not always be as generous, but will continue to seek and make the most of unique funding opportunities as appropriate, and to the best of our abilities.

MINIMUM CONTROL MEASURE 1
PUBLIC EDUCATION AND OUTREACH

Please note: All document numbering Coordinates with BASWG's Regional Storm Water Management Plan

Section 3.1 PUBLIC EDUCATION AND OUTREACH

The Bangor Area Storm Water Group has participated in a number of educational awareness and public participation activities during the preceding five year permit cycle. During the summer of 2008 the Bangor Area Storm Water Group began to shift its education and outreach activities to focus on behavior change in lawn care practices while still continuing to raise public awareness of multiple sources of storm water pollution with other awareness efforts. These efforts as outlined in this report will continue in the present 2009-2010 permit year along with the addition of some new plans for education and outreach and public participation activities.

The Bangor Area Storm Water Group has to date placed a great deal of time in discussion of lawn care activities as a primary source of storm water pollution. Recent polling done by Market Decisions for BASWG shows that approximately forty percent of those polled are willing to change their lawn care practices to help prevent storm water pollution. The Education and Outreach Committee decided to continue to focus on lawn care because of the previous research they had done and polling results indicating that the public would be receptive to behavior change in lawn care practices.

The BASWG will continue most of our past education and outreach efforts along with some new additions and updates of some of our old standbys. At the present time we have already participated in the Bangor Folk Festival, Northern Maine Children's Water Festival, Penobscot River Revival, Regional Stream Clean Up, Household Hazardous Waste Day and the Youth Education Program during the 2008-2009 permit year. The Bangor Garden Show normally held at the beginning of April was canceled this year. This year our Rubber Ducky mascot began making appearances at major events and doing classroom teaching visits along with our AmeriCorps teaching intern.

Our education and outreach activities from July 1, 2008 until June 30, 2009 included a diverse range of events and programs listed here in chronological order along with the data required under the current MS4 permit.

3.1.2 RAISE AWARENESS

3.1.2a Continue Outreach Efforts from the Previous MS4 Permit Cycle (required).

BMP 1 – Raise awareness through participation in regional events.

Measurable Goal 1 – In permit year one (PY 1) participate at the American Folk Festival, Northern Maine Children's Water Festival, and Bangor Garden Show to raise awareness of storm water issues.

The Bangor Area Storm Water Group participated in several regional events meeting the permit requirements of BMP 1. These events included The Penobscot River Revival, American Folk Festival, Residential Household Hazardous Waste Collection Day, Northern Maine Children's Water Festival,

Youth Education Program, and Regional Stream Clean-up. The Bangor Garden show was canceled so there was no BASWG participation as stated in the permit. Participation in the Penobscot River Revival was substituted for the Bangor Garden Show. The Residential Household Hazardous Waste Collection Day, Youth Education Program, and Regional Stream Clean-up also meet the requirements of Measurable Goal 1. A table of event participation by MS4 communities is attached in Appendix 1. The following summaries outline our participation in each event.

Penobscot River Revival

- Type of Behavior: Public Awareness
- Date: July 26, 2008
- Location: Bangor Waterfront
- Event Attendance:600
- Target Audience: All ages 5 – 75.
- Outreach Tools: Residential Lot (Rubber Ducky) exhibit.
- Message Delivered to Target Audience: Visitors to the exhibit gained increased awareness of sources of storm water pollution through the interactive residential lot (Rubber Ducky) exhibit.
- Implementation Schedule: July 26, 2008
- Organization Responsible for Implementation: The Lower Penobscot Watershed Coalition and the Bangor Area Storm Water Group.
- Impact Evaluation Protocol: The impact of the Penobscot River Revival was measured anecdotally. No surveys were developed at the time the event took place.
- Behavior Modification Protocol: Awareness of sources of storm water pollution gained from interactive communication, the Rubber Ducky exhibit, and informational handouts.
- Targeted level of behavior change: Targeted level of awareness change was 80% of the target audience attending the Penobscot River Revival.

American Folk Festival

- Type of Behavior: Public Awareness/Behavior Change
- Date: August 22, 23, 24, 2008.
- Location: Bangor Waterfront
- Event Attendance: Approximately 30,000
- Target Audience: All ages 5 – 85.
- Outreach Tools: Residential Lot (Rubber Ducky) Exhibit
- Message Delivered to Target Audience: Visitors to the exhibit gained increased awareness of sources of storm water pollution through the interactive residential lot (Rubber Ducky) exhibit.
- Implementation Schedule: August 22, 23, 24, 2008
- Organization Responsible for Implementation: The Bangor Area Storm Water Group.
- Impact Evaluation Protocol: Impacts were captured anecdotally, with questions about the exhibit, the ducky ad, and potential changes as a result of what they learned. This informal evaluation will be formalized in a short paper survey in PY2. Tracking of the number of lawn care pledges, while not a form of formal evaluation, indicated in part the number of people who may change behavior in the future.
- Behavior Modification Protocol: Awareness of sources of storm water pollution gained from interactive communication, the rubber Ducky exhibit, and informational handouts.
- Targeted level of behavior change: Targeted level of awareness change will be 15% of the target audience attending the Bangor Folk Festival.

Residential Household Hazardous Waste Collection Day

- Type of Behavior: Public Awareness/Participation
- Date: October 4, 2008
- Location: Bangor Public Works Storage Yard
- Event Attendance: Approximately 1,200 Vehicles
- Target Audience: Households ages 25 -75.
- Outreach Tools: Municipal newsletter, website, word of mouth, Rubber Ducky mascot, on-site questionnaire, pencils containing a written message.
- Message Delivered to Target Audience: Residents of Bangor and surrounding BASWG communities may bring hazardous household waste for safe disposal.
- Implementation Schedule: Saturday, October 4, 2008, Spring 2009.
- Organization Responsible for Implementation: City of Bangor and Local Community Volunteers.
- Impact Evaluation Protocol: On-site survey conducted by the Rubber Ducky mascot.
- Behavior Modification Protocol: Awareness/Participation encouraged by the Rubber Ducky mascot to supplement existing methods of message distribution.
- Targeted level of behavior change: Targeted level of behavior change was five percent of the residential population of participating BASWG communities pending results of baseline survey data.

Northern Maine Children's Water Festival

- Type of Behavior: Public Awareness
- Date: October 14, 2008
- Location: University of Maine, Orono
- Event Attendance:
- Target Audience: Fifth and Sixth Grade Children and Teachers.
- Outreach Tools: Rubber Ducky mascot, Watershed Model, and Residential Lot (Rubber Ducky) Model.
- Message Delivered to Target Audience: Students and teachers gained increased awareness of sources of storm water pollution through interactive watershed and residential lot models and interaction with the Rubber Ducky mascot.
- Implementation Schedule: Tuesday, October 14, 2008.
- Organization Responsible for Implementation: The University of Maine Cooperative Extension and the Bangor Area Storm Water Group.
- Impact Evaluation Protocol: Impact was measured by the number of people attending and a short questionnaire.
- Behavior Modification Protocol: Awareness of sources of storm water pollution gained from interactive communication and demonstrations using the watershed model, residential model, and Rubber Ducky mascot.
- Targeted level of behavior change: Targeted level of awareness change was eighty percent of children and adults attending the festival.

Youth Education Program

- Type of Behavior: Public Awareness
- Date: January, 2009 to May, 2009 and annually throughout the five year permit cycle. Location: MS4 Community Public and Private Elementary Schools and Youth Groups
- Event Attendance: See AmeriCorps Volunteer Report Addendum

- Target Audience: Fifth Grade Children and Teachers.
- Outreach Tools: Rubber Ducky mascot, Watershed Model, and Residential Lot (Rubber Ducky) Model. Other teaching methods may be used pending approval of the AmeriCorps Teaching Intern's supervisor and the BASWG Education Committee.
- Message Delivered to Target Audience: Students and teachers gained increased awareness of sources of storm water pollution through interactive watershed and residential lot models and interaction with the Rubber Ducky mascot.
- Implementation Schedule: December, 2008 to May, 2009.
- Organization Responsible for Implementation: The Bangor Area Storm Water Group and University of Maine Cooperative Extension.
- Impact Evaluation Protocol: Impact will be measured by a short quiz given to students prior to the beginning of the classroom teaching and near the end of the class once the demonstration and teaching have been completed.
- Behavior Modification Protocol: Awareness of sources of storm water pollution gained from classroom teaching and interactive communication and demonstrations using the watershed model, residential model, and Rubber Ducky mascot.
- Targeted level of awareness change: Targeted level of awareness change will be one hundred percent of the students and teachers attending the classroom sessions.
- See Appendix 2A participation and documentation.

Regional Stream Clean Up

- Type of Behavior: Public Awareness/Participation
- Date: May, 2009 Location:
- Participating MS4 Communities:
- Target Audience: General Public, all ages.
- Outreach Tools: Municipal newsletters, BASWG and municipal websites, word of mouth, emails, classroom teaching sessions, government cable TV, and local news media.
- Message Delivered to Target Audience: Residents of BASWG communities help prevent storm water pollution by removal of trash, litter and other materials from member community streams.
- Implementation Schedule: May 2009
- Organization Responsible for Implementation: Bangor Area Storm Water Group.
- Impact Evaluation Protocol: Completion of the clean up of the accessible portion of at least one stream during a three year period. Individual communities may set higher goals depending upon the available number of Community staff dedicated to the project, volunteers from the general public, and accessible streams.
- Behavior Modification Protocol: Awareness/Participation encouraged by the Rubber Ducky mascot to supplement existing methods of message distribution.
- Targeted level of behavior change: Targeted level of behavior change will be five percent of the residential population of participating BASWG communities pending results of baseline survey data.
- See Appendix 2B for participation and documentation.

Statewide Awareness Campaign

The Bangor Area Storm Water Group participated in the development of the Statewide Awareness Campaign. The Storm Water Awareness Committee, which included representatives from each MS4 area/cluster, Maine Department of Environmental Protection (MDEP), and the University of Maine Cooperative Extension (UMCE) was developed to create a storm water pollution message and media

that is consistent for the entire state of Maine. Contracted staff from the Cumberland County Soil and Water Conservation District (CCSWCD) developed the Statewide Awareness Plan in conjunction with the Storm water Awareness Committee. The plan was submitted to MDEP on March 2, 2009. MDEP's comments were incorporated and the plan was resubmitted on April 30, 2009. The plan was approved by MDEP on May 27, 2009.

The Statewide Awareness Message has been incorporated into television commercials, posters, the Think Blue Maine and cluster websites, informational flyers, and other media materials. See Appendix 3 for a complete summary of the Statewide Awareness Campaign.

Measurable Goal 2 – Evaluate existing displays and make improvements during permit year 1.

The awareness activities listed in Measurable Goal 1 have been evaluated for their effectiveness either by the use of on-site polling, intercept surveys, or anecdotal evaluation. The intercept polling conducted during July of 2008 indicated that our awareness campaigns have been surprisingly effective. A large part of the success of the various awareness activities may be related to the success of the Think Blue Maine rubber ducky television ad campaign.

Penobscot River Revival

The Penobscot River Revival was held for the first time on July 26, 2008 on the Bangor waterfront. Compared with other events such as the American Folk Festival attendance is rather light. The Residential Lot (Rubber Ducky) water display never fails to draw lots of children usually with their parents, (our target audience) in tow. It also attracts a large number of interested adults. Anecdotally, the Penobscot River Revival was a successful first effort but changes have been made in order to continue to attract the target audience to our exhibit. The exhibit has now been changed to a lawn care exhibit and the Rubber Ducky exhibit has been eliminated. The newer lawn care exhibit tends to lack the same drawing power as the Rubber Ducky water exhibit so there needs to be either a continuation of the use of the Rubber Ducky exhibit in concert with the lawn care exhibit or some new means to attract people incorporated into our display.

American Folk Festival

The American Folk Festival draws approximately 30,000 people so the BASWG exhibit always gets a great deal of exposure to the attendees from surrounding communities. Conversations with people visiting the exhibit indicate an extremely high level of awareness of the Think Blue Maine advertisement and the link to the BASWG exhibit. BASWG is commonly referred to as "the rubber duck people". There have never been any surveys taken during the Folk Festival but there is no doubt of the success in reaching the target audience due to the large volume of attendees visiting the booth. Last year the lawn care message was used as the primary focus of the exhibit while still using the Rubber Ducky display as a draw. The lawn care message was displayed on the exhibit backdrop and on a folding sign board. Visitors were asked to sign a pledge agreeing to use safe lawn care methods and were given a sign to place on their lawn if they signed the pledge. The lawn care pledge proved to be a very ineffective means of documenting the success of the lawn care message. Only 147 people signed the pledge and only 76 of those were from MS4 communities. Conversations indicated that many taking the pledge were already practicing safe lawn care methods. The pledge and lawn care flags would have been tried at the Bangor Garden Show but the show was canceled. For the time being the pledge is not being used and it does not seem very likely that it will be used again as a means of documentation. A new six question

survey will be used during the 2009-2010 permit year to document whether or not the lawn care message is reaching the target audience, (see Appendix 4 for survey).

Residential Household Hazardous Waste Collection Day

The Residential Household Hazardous Waste Collection day has been extremely successful and was visited by residents from all MS4 municipalities and many other local communities as well. Approximately 1000 residents participated. The visitors to the disposal site were generally from the target audience. The event was publicized through municipal newsletters, websites, and word of mouth, The Rubber Ducky mascot directed visitors to a volunteer who handed out on-site questionnaires and who also passed out pencils with a message on them directing them to BASWG website. The event was improved over prior events by the use of the mascot, and handouts with the BASWG message.

Northern Maine Children's Water Festival

The Northern Maine Children's Water Festival was targeted at fifth and sixth graders to raise their awareness of water quality issues. This event was documented by a survey taken by the AmeriCorps Teaching Intern. The children who attended came from local schools in MS4 communities as well as schools some distance away. The Rubber Ducky exhibit was used because it is geared to the target audience, in this case fifth and sixth graders. Stormie the Duck, the BASWG mascot visited the festival and was very popular with the children. (See Appendix 5 for documentation).

Youth Education Program

The Youth Education Program is the most successful and well documented of all of the BASWG events. The program is targeted at fifth graders and schools from all of the MS4 communities are visited. The one flaw in the program is that the awareness message is targeted at children rather than an adult target audience. In the long run the program should be effective as the children reach the age of the adult target audience. In most cases that is still at least fifteen years away so the benefit will not be seen immediately. Each classroom visit is documented by a short quiz given before and after the classroom teaching done by the AmeriCorps Teaching Intern. There has been some discussion of doing the Youth Education Program in high schools rather than elementary schools because the students are closer to the age of the target audience. There has been some reluctance to change because the relationships with the local elementary schools took a long time to develop and may be difficult to reestablish if lost. (See Appendix 2A for participation and documentation).

Bangor Garden Show

The Bangor Garden Show was canceled during the 2008-2009 permit year due to budget cuts. In the past the Rubber Ducky exhibit was used and was very popular. The lawn care exhibit did not draw nearly as many people but those drawn were usually within the target audience. At the present time it is not known whether or not the Bangor Garden Show will be held again.

Regional Stream Clean Up

The Regional Stream Clean Up was held in most MS4 communities and has been well attended and successful in involving volunteers of ages. Attendance varies from community to community but public involvement in general seems to be increasing each year. Much of this can be

attributed to the energy put into making contacts and promoting the clean up by the AmeriCorps teaching intern. Documentation of Public Participation has not been standardized so documentation may vary from community to community. Attendance seems to have been improved when notice of the event is given in schools a week in advance of the clean-up day. See Appendix 2B for participation and documentation.

Lawn Care Sign Board

See images of the lawn care sign board in Appendix 7.

Lawn Care Exhibit

See images of the lawn care exhibit in Appendix 8.

Responsible party – Bangor Cluster MS4 Storm water Program Coordinators

BMP 2 – Raise awareness through the use of existing materials.

Measurable Goal 1 – Continue to use materials collected from other sources over the past permit cycle as handouts at public events and town offices.

During permit year 1 the Bangor Area Storm Water group continued to use a wide variety of media to raise public awareness. Most of the materials are still in use although a few have been discontinued due to availability or lack of interest by the public. The following are some of the items used:

- Rubber Ducky Cards – These cards are the size of a business card and contain pictures of various Rubber Ducky characters and information about a particular type of storm water pollution corresponding to the exhibit backdrop. The message topics included Pet Waste, Oil and Gas Leaks, Fertilizer, Pesticides, and Soil Erosion.

- Rubber Ducky – These are the now famous Rubber Duckys used in the ThinkBlueMaine commercial with the ThinkBlueMaine web address on the front. The Rubber Ducky logo has become the logo and mascot identified with the Bangor Area Storm Water Group and the Think Blue Maine advertising campaign. Intercept polling done during July 2008 indicated that the Rubber Ducky logo has extremely high public recognition. The logo has since been incorporated into the BASWG website. A Rubber Ducky suit has been purchased and the mascot now visits various public events and classrooms. The mascot has officially been named *Stormie.*

- Door Hanger Brochures – These two sided color brochures were developed late in the permit year to be used as permit year 2 door hangers as part of the catch basin stenciling program. The brochures are customized for each neighborhood where catch basin stenciling is being done to show residents where storm water from their neighborhood goes. The brochures inform the public of lawn care methods that reduce the use of lawn care chemicals. The brochure can also be modified to be used as a handout at regional events. The address of the BASWG website is the front of the brochure for those who desire additional information on storm water pollution.

- Stream Cleanup Tee Shirts – Orange tee shirts with the yellow duck logo on the front were given out at all stream clean up events except for Brewer. The City of Brewer usually creates a tee shirt design independently

- Lawn Care Flags – Lawn Care Flags were given out to each person who signed a pledge to use chemical free lawn care methods. These flags were similar to the ones used when pesticides and herbicides are applied to a lawn. The flags had the Rubber Ducky logo, Think Blue Maine website address, and a lawn care message printed on them. The lawn care pledge program failed to appeal to the public and has been discontinued.

- Maine Yardscaping Brochures and Information Sheets – Maine Yardscaping has been one of the partners with the BASWG that has furnished numerous brochures on chemical free lawn care. A variety of the brochures have been available at past events.

- Flower Seed Bookmarks – Flower Seed Bookmarks containing a lawn care message on them have been given out during past events and were a great hit with the public. These bookmarks can actually be planted and flowers grown from them. BASWG hasn't purchased any more but probably will if finances allow.

- BASWG Pencils – The Pencils contained the "Clean Water Starts with You" message, a duck logo, and the web address for the Bangor Area Storm Water Group.

Measurable Goal 2 - Complete development of BASWG website by the end of permit year one.

The Bangor Area Storm Water Group Education and Outreach Committee in partnership with the Penobscot County Soil and Water Conservation District and The University of Maine Cooperative Extension developed a BASWG website during permit year one but completely revised the original website to focus on the lawn care message. The prototype website was Beta tested before the end of permit year one and was put on-line on July 16, 2009. The website may be seen at http://www.baswg.org/. Screen shots are also included in Appendix 12A. Tracking tools have shown that peaks in hits to the site directly corresponding with stenciling dates as well as those visiting the lawn care section of the site (See Dashboard website statistics in Appendix 12B).

Responsible party – Bangor Cluster MS4 Storm Water Program Coordinators

BMP 3 – Work with existing partners and seek out partners to help raise awareness of storm water issues.

Measurable Goal 1 – During PY 1, partner with the Lower Penobscot Watershed Coalition at their first annual event to promote storm water pollution awareness.

The BASWG partnered with the Lower Penobscot Watershed Coalition (LPWC) to host a storm water outreach booth at the Penobscot River Revival Festival in Bangor, Maine on July 26, 2008. The goal of River Revival was to encourage a renewed spirit of stewardship towards the Penobscot River. The BASWG's outreach booth focused on creating awareness about watersheds and how storm water flows through watersheds picking up pollutants, such as oil, grease, lawn chemicals, pet waste, etc. Visitors were told how to reduce storm water pollution through simple personal actions, such as better car care, cleaning up spills, reducing or eliminating lawn chemical use, and picking up pet waste and disposing of it properly. BASWG representatives handed out ThinkBlueMaine.org rubber duckys and the BASWG's informational cards to booth visitors. More than 600 people attended the waterfront event. It is estimated that at least half of these attendees stopped by the BASWG's booth. In addition to having an outreach booth, the BASWG also donated $200 in cash support towards an event port-a-potty.

Measurable Goal 2 – By the end of PY 2 investigate potential partnership with Soil & Water Conservation District to help deliver storm water awareness education.

In 2008-2009, BASWG members invited the Penobscot Soil and Water Conservation District's Director, Chris Brewer, to participate in the BASWG's monthly meetings. During PY1, Mr. Brewer attended regularly and participated in discussions about the BASWG's education and outreach goals and activities.

As the BASWG undertook planning for the new five-year permit, it became clear that a portion of the behavior change and public involvement work that had previously been covered by UM Extension staff would need to be completed by someone else. (Extension's Laura Wilson was taking a new leadership role with the upcoming Point of Sale Program). Discussions and negotiations with the District resulted in a new working partnership, with the District now serving as the primary point of contact for the BASWG's regional Stream Clean-up, as coordinator of the regional storm drain stenciling project and webmaster for the BASWG's website, which has a strong education and outreach focus. Payment for these services comes from the BASWG's local assessment funds. The District's staff bring expertise in this field and organizational structure to support their role as the regional point of contact.

By June 30, 2009, the District had 1) taken on the new website and had it "live" for use with the BASWG's behavior change project, 2) completed planning for the stenciling projects, 3) started to line up stenciling sites, and 4) was working collaboratively with BASWG staff to learn about the stream clean-up prepare to support the 2010 clean-up by providing recruitment, media outreach and other coordination services.

Measurable Goal 3 – Continue to work with existing partners such as:

- ***University of Maine Cooperative Extension;***
- ***Lower Penobscot River Watershed Coalition;***
- ***Senator George J. Mitchell Center for Environmental and Watershed Research;***
- ***Penobscot County Soil and Water Conservation District;***
- ***Cumberland County Soil and Water Conservation District; and***
- ***Maine Board of Pesticides Control.***

The BASWG has continued to work with the following partners:

University of Maine Cooperative Extension

- Extension staff member Laura Wilson attends most monthly meetings and actively serves on the BASWG's Education and Outreach Task Force.
- Ms. Wilson provided oversight and office space at Extension for AmeriCorps Volunteer Educators working to deliver storm water education in middle schools, high schools and area youth groups on behalf of the BASWG.
- With funding from a WRRI grant from the Mitchell Center, the BASWG was able to hire Laura Wilson to work with the group's MS4s to develop the required new Behavior Change Plan for the new five year permit. Laura coordinated a number of the BASWG's behavior change planning meetings.
- Extension also partnered with the BASWG to provide additional funding for lawn care behavior change work in the region. This included funding for research on the status of lawn care practices in the region, as well as better understanding of the BASWG's target audience for the behavior change program.

- Ms. Wilson currently serves as the coordinator for the BASWG's point of sale program and actively participates in guiding the BASWG's other education, outreach and public involvement programs.
- Ms. Wilson's work on a multi-year CSREES grant has allowed her to work with the group to tie in with cutting edge research and activities, as well as provide additional resources, that have greatly enhanced the work that could be accomplished.
- Extension's CSREES grant has also partially funded a Master's student to work in the region on lawn care behavior change activities.

Lower Penobscot Watershed Coalition

- The BASWG provides representation on the LPWC's board through the attendance of John Murphy (BASWG's treasurer) at board meetings.
- The BASWG has supported the LPWC's River Revival (see BMP3, MG1).
- Gayle Zydelewski (LPWC's chair) and other LPWC representatives regularly attended BASWG meetings throughout the last permit period.
- LPWC and BASWG staffs include each other on their email lists for most major communications.
- Both groups share information about the other group's activities with outside sources.

Senator George J. Mitchell Center for Environmental and Watershed Research

- The BASWG includes the Mitchell Center on their email lists for all primary organizational communications.
- John Peckenham, Assistant Director of the Mitchell Center and the BASWG's facilitator are in regular contact about research and funding issues.
- The Mitchell Center coordinates the WRRI grants program from the USGS, which funded a grant which made possible the development of the regional behavior change program and a small amount of partial funding to pilot two behavior change projects (storm drain stenciling and point of sale program).
- Several MS4s in the BUA also coordinated with the Mitchell Center to serve as research sites to test new chemical sensors for monitoring water quality, specifically phosphorus levels from storm water runoff.

Penobscot County Soil and Water Conservation District

- The BASWG has increased its partnering activities and work sharing relationship with the District during the last two years **(see BMP3, MG2).**
- The District now coordinates a number of education, outreach and public involvement projects on behalf of the BASWG.

Cumberland County Soil and Water Conservation District

- The BASWG partnered with the CCSWCD in PY1 to assist with the coordination of the statewide storm water media campaign.

- The District has served as the point of contact for the four storm water clusters in the State of Maine to plan and purchase media buys for the "Rubber Ducky" storm water outreach television and radio ad campaign.
- The District has also served as a point of contact for communications with the Interlocal Storm Water Working Group and the BASWG communicates regularly with the District and the ISWG through CCSWCD staff.
- Staff from the District have presented at several workshops (including the Watershed Manager's Conference) which BASWG members attended.

Maine Board of Pesticides Control

- The BASWG has a representative on the MBPC's Yardscaper's Committee.
- Allan Thomas, BASWG's Chair regularly attends Yardscaping planning meetings, is on their email list, and shares plans and information from the program with the members of the BASWG.
- The BASWG distributes lawn care-related MBPC pamphlets at some of its outreach events.
- MBPC has served as a partner on two grants submitted by the BASWG in the last year, both an EPA Environmental Education Grant and a grant to the Maine Outdoor Heritage Fund (neither grant was funded).

The BASWG has also expanded its planned partnerships to include new or enhanced relationships with the following organizations and agencies:

Maine Department of Environmental Protection

- Both David Ladd (SW Coordinator) and Kathy Hoppe (Environmental Educator) regularly attended the BASWG's monthly meetings in PY1. Kathy Hoppe also regularly attended the BASWG's Education and Outreach Committee meetings. Their insight into the regulatory requirements and discussion about options to achieve compliance has been very helpful to group members.
- As DEP prepared the new five year permit, BASWG members actively participated in dialog with DEP staff about regulations.
- The BASWG and Maine DEP have coordinated on numerous new projects, including the exploration of storm water utilities in the State and the statewide media campaign.
- BASWG members have both attended and presented at DEP's annual Watershed Coordinators' Meeting and other events.
- The BASWG co-presented with Maine DEP about regional storm water work at the New England Interstate Water Pollution Control Commission's Annual Meeting in Portland, Maine May 18, 2009.

AmeriCorps

- The BASWG partnered in PY1 with AmeriCorps to hire an AmeriCorps Volunteer Educator, who delivered storm water education programming in schools, to youth groups, and at various youth-focused public events.
- The BASWG funded the AmeriCorps with local assessment funding.

- The AmeriCorps intern, Sarah Johnson, conducted storm water education in each municipality within the Bangor Urbanized Area (See Appendix 2A).

Penobscot Job Corps Academy

- In spring 2009, the City of Bangor hosted partnered with the Penobscot Job Corps Academy to provide more than 250 youth members of the academy with opportunities to fulfill required service hours by working on the annual regional stream clean-up.

Plymouth State University

- Through its partnership with Cooperative Extension, the BASWG has been able to partner with Plymouth State University graduate student Nick Stevens to conduct research on the BASWG's lawn care social marketing activities and assist with the coordination and evaluation of regional behavior change activities. Nick started his work with the BASWG in spring 2009 and will continue with the group throughout PY2.

Responsible party – Bangor Cluster MS4 Storm water Program Coordinators

BMP 4 – BASWG will continue youth education efforts. (See 3.1.4 for permit years 2-5).

Measureable Goal 1: During PY 1, BASWG through the Serve Maine AmeriCorps Program will hire an AmeriCorps Volunteer for 6 months of each year to work with area youth and teachers. The AmeriCorps Volunteer will work to educate youth and teachers on storm water issues utilizing recognized curriculum materials from programs such as Project WET or Aquatic.

The BASWG funded the hiring of AmeriCorps Volunteer Educator Sarah Johnson in PY1. Ms. Johnson delivered educational programming during 30 different educational sessions between Feb 12 and May 22, 2009. Programming was delivered in all seven BUA municipalities. Educational sessions included the following lessons: life box, enviroscape, winter adaptations, incredible journey, who dirtied the water? play dough watershed models, pollution: take it or leave it, macroinvertebrate mayhem, pond sampling, happy fish, sum of the parts, and salt marsh players. She also conducted a number of several field sessions. In PY1, lessons were taught at the following schools: Bangor (Mary Snow School, Fairmount Elementary and Penobscot Job Corps Academy); Brewer (Dexter High School and Brewer Middle School); Hampden (Reeds Brook Middle School); Milford (Lewis S. Libby School); Old Town (Old Town Elementary and a semester-long series of lessons at the Stillwater Montessori School); Orono (Asa Adams Elementary School, Orono High School, Orono After School Program, and a Cub Scouts den meeting); and Veazie (Veazie Community School). Complete documentation of dates, schools, towns, numbers of students, activity descriptions for each session and pre/post quiz results are attached in Appendix 2A.

Measurable Goal 2 – BASWG will attempt to document the impact youth education efforts have on area youth. One method will be to subsample students before and after to evaluate change in knowledge and understanding of storm water issues.

At formal lesson sessions, the AmeriCorps conducted pre and post-quizzes to evaluate knowledge gain from the sessions by the participating students. Pre-lesson quiz results ranged from 13-25% correct, while post-lesson quizzes ranged from 76-91%, indicating major knowledge gains during each evaluated session. See Appendix 2A for listings of each session's pre and post quiz scores.

Responsible party – Bangor Cluster MS4 Storm water Program Coordinators

3.1.2b Storm Water Awareness Plan (required).

BMP 1 – Develop and implement Storm water Awareness Plan.

Measureable Goal 1 – By March 2, 2009 submit a plan to raise area residents understanding of storm water issues. The plan will include the following: a) the target audience, b) the outreach tool(s) to be used, c) the message, d))the distribution system, e) the time line and implementation schedule, f))the person(s) responsible for implementation, g) an impact evaluation protocol, h) a plan modification protocol (this must include DEP approval of significant plan modifications), and I) the goals (e.g., the targeted level of change sought as a result of the education and outreach effort). Specific measurable goals for implementing the plan will be set during the Plan development

The Storm Water Awareness Committee, which included representatives from each MS4 area/cluster, Maine Department of Environmental Protection (MDEP), and the University of Maine Cooperative Extension (UMCE) jointly participated in a storm water awareness shared planning process. This process resulted in the development and acceptance of new shared awareness plan, which was adopted by all MS4s in the State of Maine, including all BASWG MS4s. BASWG representatives on the planning committee were Wendy Warren and Scott Wilkerson. The BASWG voted to fund implementation costs for the plan through local assessment dollars, which were unanimously approved in the FY10 BASWG budget. The plan was submitted to MDEP on March 2, 2009. MDEP's comments were incorporated and the plan was resubmitted on April 30, 2009. The plan was approved by MDEP on May 27, 2009. The complete regional behavior change plan is attached in Appendix 15.

Measurable Goal 2 – Start implementation of the Storm Water Awareness Plan by July 1, 2009.

Implementation completed before July 1, 2009 included message testing, selection of the message "follow the flow", and the development and dissemination of outreach materials through a revised ThinkBlueMaine.org website (including a manager's electronic toolbox for outreach support) and the purchase of a media buy to run the ducky ad campaign for three weeks in August. Follow the flow outreach posters were planned for dissemination in late August. A complete Statewide Outreach Plan Report is attached in Appendix 3.

Responsible Party – Bangor Cluster MS4 Storm water Program Coordinators

BMP 2 – Evaluate and assess implementation and impact of Storm Water Management Plan.

Measurable Goal 1: Assess target audience in year one to set baseline level of awareness.

Existing assessments of the target audience (statewide Omnibus survey and Bangor Area Storm Water Group's intercept survey) offered sufficient data to determine a baseline level of awareness. Based on the two surveys referenced, 35% of our target audience already understands that storm water impacts water quality.

Responsible Party – Bangor Cluster MS4 Storm Water Program Coordinators

3.1.3 TARGETED BMP ADOPTION (required)

3.1.3a Continue Targeted BMP Adoption efforts from previous MS4 permit cycle.

BMP 1 – Utilize existing lawn care exhibit at appropriate local events.

Measureable Goal 1 – In PY1 participate in the Bangor Garden Show where attendees will be asked to pledge to use less lawn chemicals. They will be offered a sign for their yard that says safe for kids and pets.

The Bangor Area Storm Water Group was scheduled to participate in the Bangor Garden Show in April of 2009 but the show was canceled due to budget cuts. The planned Education and Outreach activities included Lawn Care Pledges, tip sheet handouts, and lawn care flags for those persons taking the lawn care pledge.

The BASWG opted instead to participate in the American Folk Festival as its primary awareness event. A modified plan was followed in the 2009 American Folk Festival held on August 28, 29, and 30. The plan was based upon experiences in last year's Festival. The lawn care backdrop was placed behind the residential lot (Rubber Ducky) exhibit.

The residential lot exhibit continued to attract children with parents within the target audience. This allowed BASWG volunteers to engage parents and collect surveys on lawn care practices. A new survey developed for the Folk Festival was used to assess the target audience's degree of awareness of chemical free lawn care practices and willingness to change their lawn care practices to eliminate the use of chemicals.

Lawn care pledges and flags were not used because of a lack of interest by the public during previous events and the lack of comfort of volunteers in engaging the public on this issue. A new handout was used this year that is a modified version of the door hanger that is being used in the stenciling program. The double sided tip sheet has a very simple message, "It's Easy to Reduce Your Use of Lawn chemicals" The flyer directs people to the BASWG website for more information and to local businesses offering recommended lawn care products.

There has been some discussion as to whether or not the results of participating in the Folk festival are worth the amount of time invested. *During the last few years the rapid changes in information technology and social media have almost rendered the present form of education and outreach activities obsolete. It may be time for the Education and Outreach Committee to explore new forms of media that are able to engage a much broader segment of the target audience.*

The American Folk Festival was not well attended this year due to extremely heavy rain on Saturday.

Measureable Goal 2 – Continue to distribute lawn and garden care materials collected during the first permit cycle. Materials will be made available at town offices, BASWG booth and events.

The BASWG has developed and borrowed a number of materials for use in education and outreach activities. These include the Maine Yardscaping lawn care tip sheets, BASWG Door Hanger/Flyer, various University of Maine Cooperative Extension tip sheets, the BASWG website, the Rubber Ducky commercial, Bangor lawn care power point, flower seed bookmarks, lawn care flags, rubber duckys with the Think Blue Maine web address printed on them, stream clean up tee shirts, pollution card handouts, pencils with the BASWG web address and logo on them, and refrigerator magnets.

These materials were given out or displayed at the American Folk Festival, Bangor Garden Show, Northern Maine Children's Water Festival, Regional Stream Clean Up, Residential Household Hazardous Waste Collection Day, and Penobscot River Revival. Media materials were also furnished to any member community upon request for distribution at town offices and airing on local public access television stations.

Measurable Goal 3 – Depending on recent grant application, BASWG will work with Cumberland County SWCD to develop "Point of Sale" model to encourage residents to utilize environmentally friendly products for lawn and garden care BMPs. Project would commence in November 2008 and continue through permit year one. This will be a transferable model.

The BASWG has partnered with University of Maine Cooperative Extension to develop and implement at Point of Sale Program targeting homeowners who currently apply fertilizers, pesticides and herbicides to their lawns themselves, with a targeted age range of 30-55 years of age. Plans for the Point of Sale Program are outlined in the BASWG's 5-year Behavior Change Plan (Appendix 15). The BASWG members worked with Laura Wilson of Extension to develop a project plan. Implementation will take place primarily in PY2; however, the project already has five stores that provide lawn care products in the BUA signed up to participate. These sites are listed on the BASWG and have participated in training activities.

Responsible Party – Bangor Cluster MS4 Storm water Program Coordinators

3.1.3b BMP Adoption Plan (required)

<u>BMP 1 – Develop and implement Behavior Change Plan</u>

Measurable Goal 1 – By March 2, 2009 submit a plan to encourage targeted audience to adopt or practice specific BMPs that will reduce storm water pollution. BASWG will target at least 15% of the targeted population. The Plan will include: a) the BMP, b) the target audience, c) the outreach tool(s) to be used, d) the message, e) the distribution system, f) the time line, g) the person(s) responsible for implementation, h) an impact evaluation protocol, I) plan modification protocol, and j) The targeted level of change as a result of the outreach effort. Specific measurable goals for implementing the plan will be set during the Plan development

The BASWG, working with University of Maine Cooperative Extension's Laura Wilson through targeted behavior change planning sessions, assisted the group in the development of a five-year regional behavior change plan. The plan was submitted to MDEP on February 26, 2009. MDEP's comments were incorporated and the plan was resubmitted on May 22, 2009. The plan was approved by MDEP on June 23, 2009.

The BASWG regional behavior change plan includes implementation activities for all 12 MS4s within the BUA. This process was based on thorough review of existing data (including Omnibus Survey, Focus Groups and a recent CSREES-funded lawn care survey) to craft the behavior change messages and methods. The plan's goal is the reduction or elimination of fertilizer and/or pesticide use by 15% of homeowners aged 30-55 years of age who currently apply lawn care products themselves within the region. The plan engages multiple outreach tools, including message delivery at the point of sale as a primary tool, coupled with use of free media, websites and direct one-on-one message delivery through storm drain stenciling projects. A copy of the complete BASWG Behavior Change Plan is attached in Appendix 15. Message creation was guided by research compiled in "*Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Loss in New England's Urbanizing Habitats: Influential Qualitative Data Analysis Findings and Implications for Message Creation*" (Appendix 17).

To date, implementation (which will be happening primarily in PY2-PY5) has included recruitment of stores to participate in the point of sale program, PCSWCD taking over management and coordination of the Storm Drain Stenciling program, and scheduling of storm drain stenciling projects in the City of Bangor for this Fall.

Responsible Party – Bangor Cluster MS4 Storm Water Program Coordinators

BMP 2 – Evaluate and assess implementation and impact of BMP Adoption Plan.

Measurable Goal 1: Assess target audience in year one to set baseline level of awareness.

The target audience for BASWG's behavior change projects is homeowners aged 30-55 who currently apply fertilizers, pesticides, and/or herbicides to their lawn themselves (hereafter known as "DIYers"). The goal of the BASWG's behavior change plan is to get DIYers to reduce their use of lawn chemicals.

The BASWG conducted an intercept survey of DIYers in the Greater Bangor Urbanized Area in 2008. This survey showed that 28% of intercept survey respondents had taken action as a result of a local storm water outreach effort, and 33% of respondents already have reduced the amount of fertilizers/pesticides that they use.

An intercept survey will be conducted in Permit Year 3 and Permit Year 5 of the permit cycle to measure the continued effectiveness of the program and quantify the progress made on increasing the numbers of citizens changing specific lawn care behaviors.

Responsible Party – Bangor Cluster MS4 Storm water Program Coordinators

3.1.4 IMPLEMENT YOUTH EDUCATION PROGRAM

BMP 1 – Provide storm water and water quality educational opportunities to area youth and educators PYs 2-5 (see 3.1.2a for permit year 1).

Measurable Goal 1 – Provided funding is available, contract annually with Maine Conservation Corps for a 6 month AmeriCorps position. Position will run from January to June of each permit year.

The Bangor Area Storm Water Group contracted with the Maine Conservation Corps for a six month AmeriCorps Teaching position during permit year 1. The Bangor Area Storm Water Group will contract with the Maine Conservation Corps for a six month AmeriCorps Intern Position for permit years 2 – 5 provided funding is available. The 2009 position ran from January to June.

Measurable Goal 2 – Provided funding is available, partner with Maine Cooperative Extension Service to provide supervision, direction, and materials for AmeriCorps Volunteer for all 5 permit years.

During permit year 1 the University of Maine Cooperative Extension Service provided supervision, direction, and materials for an AmeriCorps Intern position. The BASWG will partner with the University of Maine Cooperative Extension Service and the Penobscot County Soil and Water Conservation District to provide supervision, direction, and materials for an AmeriCorps Intern position for permit years 2-5 provided funding is available. The Internship term will run from January to June of each permit year.

Measurable Goal 3- Provided BASWG has an AmeriCorps Volunteer, annually contact local schools, scout groups and other youth organizations to offer classroom and field water related learning

opportunities.

During permit year 1 an AmeriCorps teaching intern (Sarah Johnson) contacted local schools, scout groups, and other youth organizations and conducted a Youth education Program. Ms. Johnson delivered educational programming during 30 different educational sessions between February 12-May 22, 2009. Programming was delivered in all seven BUA municipalities. In PY1, lessons were taught at the following schools: Bangor (Mary Snow School, Fairmount Elementary and Penobscot Job Corps Academy); Brewer (Dexter High School and Brewer Middle School); Hampden (Reeds Brook Middle School); Milford (Lewis S. Libby School); Old Town (Old Town Elementary and a semester-long series of lessons at the Stillwater Montessori School); Orono (Asa Adams Elementary School, Orono High School, Orono After School Program, and a Cub Scouts den meeting); and Veazie (Veazie Community School). Extensive documentation of the schools and groups visited, lessons taught, number of visits, and other data are given in Appendix 2A.

Provided that an Americorps position is funded during permit years 2-5, an Americorps Teaching Intern will continue to contact local schools, scout groups, and other youth organizations each permit year to offer classroom and field water related learning activities.

Measurable Goal 4 - BASWG will attempt to document the impact youth education efforts have on area youth. One method will be to subsample students before and after to evaluate change in knowledge and understanding of storm water issues.

Extensive documentation of the teaching activities and impact of the Youth Education Program conducted by the Americorps Teaching Intern is provided in The documentation includes before and after lesson quizzes for each classroom activity to measure the impact of the activity on the student's knowledge of storm water pollution and other storm water related issues.

Responsible Party – Bangor Cluster MS4 Storm water Program Coordinators

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MINIMUM CONTROL MEASURE 2
PUBLIC INVOLVEMENT AND PARTICIPATION

3.2 PUBLIC INVOLVEMENT AND PARTICIPATION

3.2.2 PUBLIC NOTICE (required).

BMP 1 – Provide an opportunity and encourage public input into regional storm water program.

Measureable Goal 1 – BASWG will follow state and local Public Notice requirements for both BASWG and individual Storm water Management Plans. Copies of the plans will be made available on the Maine DEP web site.

The BASWG Storm water Management Plan and documents are kept on file at each of the regulated MS4s municipal or facility offices with a backup copy located at DEP offices in Augusta, Maine. All BASWG MS4 Storm water Plans were posted on Maine DEP's website for public comment. Copies and review of documents are made available when requested by appropriate government agencies and public safety groups.

Measureable Goal 2 – BASWG will provide opportunities for stakeholder input and involvement during implementation of the Storm water Program.

All meetings of the BASWG are open to the public and posted on municipal calendars to ensure that the public is notified of meetings. The BASWG's new website will also be posting meeting announcements and minutes online in PY2. The BASWG is working on a stakeholder engagement plan to actively engage a range of new stakeholders in implementation discussions and activities in future permit years.

Responsible party – Bangor Cluster MS4 Storm water Program Coordinators

3.2.3 HOST REGIONAL PUBLIC EVENTS (required)

BMP 1 – Host regional event.

Measurable Goal 1 – BASWG will annually host a regional stream clean up event to raise awareness of water pollution issues and bring attention to area water resources.

The BASWG coordinated a third annual regional stream clean-up (comprised of ten individual clean-up events in the months of April and May 2009). Clean-ups were designed to engage citizens in showing community spirit and protecting local water resources. Children, adults, local organizations, businesses, groups and individuals all participated in the events.

Municipal clean-ups were held on May 9th in the towns of Hampden and Veazie; on May 16th in the City of Bangor (on Penjajawoc and Birch Streams) and Brewer, as well as the Town of Orono; and on May 30th in the town of Milford. Additional clean-ups were conducted on Maine Day at the University of Maine and at an event called "Penobscot to Penobscot" which engaged 265 Job Corps youth in cleanup activities.

Regional coordination between the individual stream clean-ups was coordinated by AmeriCorps volunteer Sarah Johnson. Coordination and implementation of individual stream clean-ups were managed by individual MS4s. Regional coordination efforts included creation of a regional flyer, press release, newsletter article, website blurb, public access television slide materials used both at the regional and local levels to recruit public participation and create awareness about the event. In addition, Sarah created both regional and local donor and volunteer solicitation letters, as well as donor thank you letters. She coordinated the posting of outreach about the event on the MPBN Community Calendar, Volunteer Maine Website, and the BASWG's Facebook Group Page. Copies of all Stream Clean-up outreach and solicitation materials are located in

A total of 836 volunteers participated in clean-ups region-wide. An estimated 1,073 bags of trash were collected by citizen clean-up teams through these events, totaling approximately 16,484 pounds of trash. This equates to 8.2 tons of potential polluting waste removed from the region's waterways. Data on collection activities at each Stream Clean-up is located in Appendix 2B.

Sarah developed, distributed, collected and tabulated volunteer survey cards to evaluate the public participation experiences of stream clean-up volunteers. Of the 324 survey respondents, 23% of participants were aged 0-12, 12% aged 13-17; 18% aged 18-24, and 47% were over 25 years old. Of all the participants regionally, 64% were participating in the stream clean-up for the first time. Suggestions for event improvements ranged from live music, food and drink to small changes in implementation planning (such as food allergy precautions, different systems for trash bag use, better maps and directions on where to clean-up). Most notably, one respondent from the Brewer clean-up said it would be helpful

to have "dirtier places" to clean-up. Complete evaluation data, broken down by Clean-up is located in Appendix 2B.

Measurable Goal 2 – Encourage and look for opportunities to utilize storm drain stenciling to educate area residents about storm water issues.

The BASWG developed a storm drain stenciling plan as part of the BASWG's five-year Behavior Change Plan. Coordination of the stenciling program was taken over by the Penobscot County Soil and Water Conservation District in June 2009. Implementation will begin in PY2. Stenciling projects were planned by July 1, 2009 for implementation in the following areas starting July 16th:Veazie, Buck Hill and Silver Ridge; painting of the stencil image on Town of Milford Garbage Trucks, Milford's Oak Street neighborhood. Stenciling activities include recruitment and training of citizen stenciling teams, door hangers for neighborhoods where stenciling is occurring, and direction to the BASWG's lawn care pages on the BASWG.org website.

Responsible Party – Bangor Cluster MS4 Storm water Program Coordinators

3.2.4 DEVELOP PARTNERSHIPS WITH REGIONAL ORGANIZATIONS

BMP 1 - The BASWG will seek new and expand on existing partnerships both in the State and Bangor region to increase the efficiency with which the BASWG's and individual MS4's Storm water Management Programs are implemented.

Existing partnerships include but are not limited to:

- University of Maine Cooperative Extension;
- Lower Penobscot River Watershed Coalition;
- Senator George J. Mitchell Center for Environmental and Watershed Research;
- Penobscot County Soil and Water Conservation District; and
- Cumberland County Soil and Water Conservation District; and
- Maine Board of Pesticides Control.

Measurable Goal 1 – Increase the amount of projects and collaboration done between BASWG and the before mentioned partners to better deliver the storm water program.

Penobscot County Soil and Water Conservation District

- The BASWG has increased its partnering activities in PY1 and now shares a strong working relationship with the District. The District now coordinates the BASWG's regional stream clean-up and storm drain stenciling projects, which both involve extensive public participation (see BMP 3, Measurable Goal 2).

University of Maine Cooperative Extension

- The BASWG partnered with Extension to have Extension Water Quality staff member Laura Wilson coordinate the Point of Sale Program, which engages community members (both in terms of store owners and staff, and the public in participating in making their lawns more storm water friendly through the reduction of chemical use on their lawns. Ms. Wilson also coordinated the community participation portion of the planting of Hampden's community rain garden.

Lower Penobscot River Watershed Coalition

- The LPWC coordinated an additional stream clean-up to coincide with the BASWG's regional stream clean-up on Cove Brook, which engaged citizens in cleaning trash from the brook's shores.

Senator George J. Mitchell Center for Environmental and Watershed Research

- BASWG partnered with UMaine Facilities Management and Extension to apply for a WRRI grant from the Mitchell Center, which provided the initial support for developing the behavior change plan and providing partial support for developing the point of sale model, planning for the community stenciling projects, and bringing in Nick Stevens as a graduate student to work on regional behavior change message testing and project evaluation.

Cumberland County Soil and Water Conservation District & Maine Board of Pesticides Control

- During PY1, the BASWG used some of the CCSWCD's model tools and techniques to develop the Point of Sale Model. The group also connects with CCSWCD and MBPC for technical assistance. The BASWG distributes lawn care-related MBPC pamphlets at some of its public participation events, incl. stenciling events.

Measurable Goal 2 – Add new partners to the storm water program who can help deliver both the program and storm water pollution message.

Greater Bangor Area Civic Groups, Youth Groups and Schools

- A total of 836 volunteers from the seven regional communities donated half a day worth of time to participate in 2009 Regional Stream Clean-up activities.
- Sixty-four percent of these volunteers were volunteering for the clean-up for the first time, successfully meeting the BASWG's goal to increase public participation.
- A complete report on the Stream Clean-up at its participants can be found in Appendix 2B.
- During PY1, the BASWG's AmeriCorps volunteer worked with school groups to conduct stenciling activities throughout the region.
- The City of Old Town partnered with Leonard Middle School to plant a rain garden near mud pond.

Greater Bangor Area Local Businesses

- All costs of the event are paid through donations of cash and in-kind support, services are donated by municipal staff, and teams are comprised of community volunteers.
- In 2009, the BASWG partnered with ten regional sponsors (Lane Construction, Sunrise Materials, N.H. Bragg and Sons, Edward's Family Shop-N-Save, Bangor Daily News, Casco Bay Energy, Union Street Athletics, Eaton Peabody, The Grasshopper Shop and Miller Drug).
- Dozens of local businesses also supported local clean-ups through donations.
- A complete report on the Stream Clean-up's donors can be found in Appendix 2B.

- Local businesses were also active partners in the development and planting of the Hamden Rain Garden. Numerous businesses donated materials, provided discounts on supplies and Casella Waste provided volunteers to assist in the planting of the garden.

Responsible Party – Bangor Cluster MS4 Storm Water Program Coordinators

3.2.5 ASSIST WITH REGIONAL HOUSEHOLD HAZARDOUS WASTE PROGRAM

BMP 1 – Promote HHW collection program.

Measurable Goal 1 – Provided that funding is available for HHW program, BASWG will promote the collection on their web site and in other appropriate locations.

On October 4, 2008, the City of Bangor sponsored the annual Regional Household Hazardous Waste Collection Event. Twenty-three communities, including all the BASWG communities, participated in the event by advertising, sending volunteers to staff the event and paying their fair share (proportionately) of the cost of the collection and disposal. This year the BASWG also helped to sponsor the event, providing the BASWG's ducky mascot supporting the development and analysis of an event participant survey. A copy of the HHW Collection Event press release is attached in Appendix 5.

Measurable Goal 2 – BASWG will evaluate data regarding the collection (numbers of participants, level of community participation, amount of materials collected) to determine ways to improve participation across communities and demographics. Resulting conclusions will be shared with HHW collection program to improve the program where possible.

The BASWG's mascot duck was used (with an assistant) to walk around during the waste collection and ask participants to complete a short survey while they waited in lint to dispose of their waste.

The top three wastes collected at the event were:

- Oil-based paint and paint products - thinners, varnishes, etc. (estimated amount: 17,000 pounds for all event participants, not just those from BASWG communities).
- Pesticides (est. amount: 2,400 pounds)
- Antifreeze (est. amount: 1,600 pounds)

82% of the 521 survey respondents were new to the event and had not participated in the HHW event before. Mot of the participants learned about the event through their town newsletters.

Suggestions for improving the event included making the permits easier to get (online), allowance for drop-off or more than one computer or television at a time. Respondents thought that hazardous waste minimization and lawn care information should be provided nearby. Other promotion ideas included placing fliers in recycle bins, notices in tax bills, ads on BAT busses, notes sent home with students, use of public service announcements and coverage in local newspapers. Ideas for improving participation included earlier advertizing and advertisements around town and in local businesses, emphasis of the "green" aspect of the HHW event, better signs on the main road, and emphasis on the short lines and how easy it is to drop off items.

Responsible Party – Bangor Cluster MS4 Storm Water Program Coordinators

MINIMUM CONTROL MEASURE 3
ILLICIT DISCHARGE DETECTION AND ELIMINATION

3.3.1 MCM GOALS

- Develop a detailed watershed-based storm sewer system infrastructure map;
- Implement and enforce a non-stormwater discharge ordinance;
- Develop and implement a prioritized dry weather outfall inspection plan; and
- Implement a strategy to detect any illicit discharges to the open ditch system within each MS4's highest priority watershed.

For specific permit requirements and suggestions, refer to MDEP's General Permit for the Discharge of Stormwater from Small Municipal or State or Federally Owned Municipal Separate Storm Sewer Systems Part IV(H)(3).

3.3.2 WATERSHED BASED STORM SEWER SYSTEM INFRASTRUCTURE MAP

BMP 1 – Develop a watershed based storm sewer system infrastructure map.

> *Measurable Goal 1 – At a minimum, Bangor will review its storm sewer infrastructure maps and update them as necessary in PY 1.*

Bangor has thirty three drainage areas within the urbanized area. Mapping and updating all storm sewer infrastructure is a huge task. To date, the City has completed about 2/3. A new GIS Specialist was added to the Engineering Department Staff in 2009 that will help in getting all the mapping completed and updated and converted from CAD to GIS in Permit Year 2. The following listing shows the mapping status as of June 2009.

Impaired Stream Watersheds
Birch Stream mapping complete
Penjajawoc Stream mapping in progress (about 75% complete)
Arctic Brook mapping in progress
Capehart Brook mapping completed. (Needs to be updated to include recent developments)
Shaw Brook not mapped

East Side Watersheds
Outer State Street not mapped
Woodlawn partially mapped
Carr Brook mapped
Hancock mapped
Kenduskeag East Combined Sewer System (Non-MS4) mapped
Central Combined Sewer System (Non-MS4) mapped
Franklin mapped
Meadowbrook Combined Sewer System (Non-MS4) mapped
Mill Street 1 mapped
Mill Street 2 mapped

Blanchard mapped
Husson not mapped
Glenwood not mapped
Strickland not mapped
Burleigh / Broadway partially mapped

West Side Watersheds
Kenduskeag West Combined Sewer System (Non-MS4) mapped
Everett mapped
Fourteenth mapped
Cemetery mapped
Westland/Ohio not mapped
Short/Union mapped
May mapped
Davis Brook Combined Sewer System (Non-MS4) mapped
Bass Park/Casino not mapped
Catell mapped
Barkersville Combined Sewer System (MS4) mapped
Olive mapped
WWTP/Hampden Connector mapped
Industrial Park partially mapped
Sucker Brook partially mapped

Measurable Goal 2 – Annually, starting in permit year one, Bangor will map at least 20% of the storm sewer infrastructure within the respective regulated urbanized area. Note: Bangor will initiate mapping in the Birch Stream and the Penjajawoc watershed.

Permit Year 1 - Birch Stream mapping has been completed. Penjajawoc mapping is in progress. Birch Stream and that portion of Penjajawoc that has been mapped comprises approximately 20% of the City in its entirety, not just the MS4 area.

Measurable Goal 3 – By the end of PY 5, Bangor will have completed the development of a watershed based storm sewer system infrastructure map showing the location of all stormwater catch basins, connecting surface and subsurface infrastructure depicting the direction of in-flow and out-flow pipes, and the locations of all stormwater outfalls operated by the regulated MS4.

Permit Year 1 - Bangor hired a GIS Specialist in June of 2009, and is on track to complete the required mapping by the end of Permit Year 5.

BMP 2- The BASWG will support the development of a regional watershed-based storm sewer infrastructure map with the goal of combining it with the database management tool that will be implemented by the group during the current permit cycle.

Measurable Goal 1 – In permit years one through five, Bangor will collaborate to integrate existing storm sewer map information annually into a database management system.

Permit Year 1 - Bangor has initiated a Geographical Information System (GIS) with a priority focus of stormwater mapping. When the database has the capacity, the City's GIS maps will be integrated into the Stormwater Steward Database, if appropriate.

3.3.3 NON-STORMWATER DISCHARGE ORDINANCE

BMP 1 – Adopt non-stormwater discharge ordinance.

Measurable Goal 1 – Adopt and implement ordinance by November 28, 2008.

Bangor's ordinance was adopted in Permit Cycle 1. Implementation is accomplished through numerous avenues, including our own code enforcement officers and by providing notice to appropriate agencies, such as DEP's floor drain division, or DEP's Division of Hazardous Materials Response.

Measurable Goal 2 – The BASWG will annually evaluate illicit discharge incidents within regional MS4s and select examples from those that occur to discuss as a group.

Mark Ward, Wendy Warren, and John Murphy discussed the City's experiences and how we dealt with illicit discharges with the BASWG at the August 2009 regular meeting.

There were several illicit discharges discovered throughout the past reporting year.
Following is a brief description of reported incidences:

1) Penjajawoc Stream Volunteer monitoring revealed high conductivity in the Meadow Brook (tributary to the Penjajawoc). DEP followed up with an investigation further upstream and found no discrete sources, and has assumed that road salt and spring thaw along with salt leaching from soils is the cause of the high conductivity.
2) DEP Stormwater Inspector Lauren Lohn discovered hazardous industrial residues being spilled into floor drain and outdoors both connected to the storm drain system. The City was notified and the Code Enforcement Officer also issued violations to the property owner.
3) A resident reported to the City that a neighbor was parking his leaking vehicle over a storm drain to receive the leaking oil. The City Code Enforcement officer investigated, the Public Works Dept., brought over clean up materials, and the DEP Hazardous Spill Response Team was notified. The Response Team issued notice to clean up or be fined for the clean up.
4) An anonymous caller notified the City that a particular storm drain was found to have oily residue draining into it, suspecting that a nearby auto mechanic may have an illicit connection to the storm system. The City notified DEP floor drain division who investigated and found no such illicit connection.

3.3.4 DRY WEATHER OUTFALL INSPECTION PROGRAM

BMP 1 – Develop dry weather outfall inspection program.

Measurable Goal 1 – Prioritize Watersheds

Bangor has selected Birch Stream Watershed and Penjajawoc Watershed as priority watersheds. The next priorities will be Arctic Brook, then Shaw Brook, and last, Capehart Brook.

Measurable Goal 2 –Bangor will develop new or rely on existing SOP for dry weather outfall inspection program by the end of PY1.

Bangor has developed the following Dry Weather Outfall Inspection Protocol:

City of Bangor
Municipal Separate Storm Sewer System (MS4)
Stormwater Management Program
Dry Weather Outfall Inspections

Introduction

The City's MS4 Stormwater Permit requires that municipal operated storm drain outfalls be inspected annually) to report on physical condition and to determine if dry weather discharges exist. The inspection / reporting year is July 1 to June 30. It is recommended that inspections take place in July or August to allow time for any corrective or remedial activities to be undertaken before winter.

Outfalls with discharges during dry weather may indicate the presence of an illicit connection to the storm drain system or illegal dumping into storm drains. Additional investigation will be required to determine the source of the dry weather flow.

Outfall Locations

Storm Drain systems are shown on watershed maps compiled and maintained by the Engineering Department. Each outfall location where the storm drain system discharges to a waterbody has a unique identification code which shall be used by inspectors on each reporting form.

Outfall Inspections

1) Outfall inspections will be the responsibility of the City Engineer or designated representative.
2) Inspections will be conducted by trained City staff or contracted third party inspectors.
3) Inspections must be conducted during dry weather (no precipitation for 72 hours prior to inspection.
4) Inspectors will comply with all appropriate safety requirements for the conditions of the inspection site.
5) Inspection information will be recorded on a Dry Weather Outfall Inspection Form. One form will be used for each outfall. Forms may be paper or electronic on handheld devices. A copy of the Dry Weather Inspection Form is included at the end of this document.
6) Data collected on inspection forms will be entered into the Stormwater Steward Database for reporting and recordkeeping purposes.
7) It is recommended that a digital photograph be taken of each inspected outfall.

Physical Deficiencies

Outfalls with physical deficiencies shall be flagged for corrective action.
Physical deficiencies include but are not limited to broken or separated pipes, eroded channels,, and sediment accumulation.

Dry Weather Discharge Follow up Procedures

Outfalls that discharge a flow during dry weather inspections shall be flagged for additional effort to determine the source of dry weather flow.The following additional efforts may take place to assist in finding the source of the dry weather discharge:

The storm drain pipe, channel, or ditch shall be inspected from the outfall upstream to visually check for sources of flow. For piped systems, drain manholes and catch basins will need to be visually inspected for active flow.

If the source of flow cannot be visually determined in piped systems, a CCTV inspection or dye testing may be required by the Bangor Sewer Department.

If the dry weather discharge has obvious odor, color, fecal matter, oily sheen, or floatable materials, laboratory test samples should be taken and tested by the City's contracted testing consultant.

Dry Weather Flow Source Inspection

The source of dry weather flow shall be inspected to determine if it is in violation of the City Illicit Discharge Ordinance as can be found on the City's website at the following URL: http://ecode360.com/?custId=BA1684 section 197-5 titled Prohibition of non-stormwater discharges. Sources of unallowed dry weather flows will be subject to enforcement action in accordance with City Ordinance.

Measurable Goal 3 – Bangor will develop inspection forms and have a data management system in place for dry weather outfall inspections by the end of PY 1.

Bangor used the Inspection Form developed for the Storm Water Steward Database for 2009 inspections. The Stormwater Steward Database is being used for Outfall Inspection data management.

Measurable Goal 4 – Bangor will train MS4 staff on how to conduct and record dry weather inspections by the end of PY1.

Wendy Warren, Mark Ward, and Jeremy Martin attended Stormwater Steward training sessions including use of the dry weather outfall inspection form and protocol.

Measurable Goal 5 – Bangor will develop and implement a policy/procedure or protocol that identifies the steps that must be taken when an illicit discharge is encountered by the end of PY1.

The City of Bangor Code of Ordinances includes Chapter 197 titled NON-STORMWATER DISCHARGES. This ordinance numbered 05-239 adopted on July 25, 2005, can be found online at the following URL: http://ecode360.com/?custId=BA1684, or by accessing www.bangormaine.gov and searching the Code of Ordinances by ordinance number. The ordinance includes Section 197-6 Suspension of Access to MS4, and section 197-8 Enforcement which sets forth penalties for violations of the ordinance.

BMP 2 – Implement dry weather inspection program.

Measurable Goal 1 – By the end of PY 1, Bangor will conduct dry weather outfall inspections in at least Birch Stream and Penjajawoc Stream Watersheds.

Birch Stream outfalls have been inspected. The inspection information has been entered into the Stormwater Steward Database. Penjajawoc Stream outfalls were not inspected in PY 1 due to an extended rainy Spring season limiting the number of days that inspections could be conducted. Staff will attempt to conduct dry weather outfall inspections during the winter season if it is safe to access them.

Staff inspected and photographed 9 outfalls in Birch Stream. The results of the inspections were recorded in the Stormwater Steward Database. A photo of the summary report of the inspections is pasted below.

Inspections

Dry Weather Outfall

Site/Inspector/Inspection Date			Approximate Temp	Color (if flow is present)	Follow up required	General Comments
Birch Stream 1	Bangor Eng 1	6/4/2009			Yes	Delete This Inspection Form.
		9/11/2009	68	Clear	Yes	24" Dia. corrugated metal pipe
Birch Stream 2	Bangor Eng 1	6/4/2009	68		No	End of pipe is broken. Pipe is
Birch Stream 3	Bangor Eng 1	6/4/2009	68	Clear to Brown.	Yes	Sediment and Algae cover botto
Birch Stream 4	Bangor Eng 1	6/4/2009	68	Light Brown	No	Algae mat covers rocks at outf
Birch Stream 5	Bangor Eng 1	6/4/2009	68	Light Brown	No	Algae and rocks cover bottom o
Birch Stream 6	Bangor Eng 1	9/14/2009	68		No	#0 " corrugated metal pipe loc
Birch Stream 7	Bangor Eng 1	6/4/2009	68		No	4" PVC pipe located at end of
Birch Stream 8	Bangor Eng 1	9/14/2009	72	Clear	Yes	36" Reinforced concrete pipe l
Birch Stream 9	Bangor Eng 1	9/14/2009	72		Yes	The "outfall" appears to be an

3.3.5 OPEN DITCH ILLICIT DISCHARGE PROGRAM – Not applicable in PY1

3.3.6 IMPLEMENT AN INFORMATION MANAGEMENT SYSTEM FOR TRACKING ILLICIT DISCHARGES

Measurable Goal 1 – By the end of PY 1 BASWG will develop a regional database system to provide the BASWG members with a more efficient and cost effective way to manage and report

data for the MS4 General Permit.

The Stormwater Steward Database was implemented by Bangor in April, 2009.

MINIMUM CONTROL MEASURE 4
CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

3.4.1 MCM GOALS

Develop, implement, and enforce a program to reduce pollutants in any stormwater runoff to the regulated small MS4 from construction activities that result in a land disturbance of greater than or equal to one acre that includes:

- Notification to contractors and site developers that intend to disturb one or more acres.
- Municipal tracking of construction activities that disturb one or more acres.
- Construction site inspection program.

Bangor determined that it will refer to MDEP's General Permit for the Discharge of Stormwater from Small Municipal or State or Federally Owned Municipal Separate Storm Sewer Systems Part IV(H)(4). However, realizing that State inspections are conducted on a very limited basis, many construction site inspections are conducted by our code enforcement office without compensation from the State.

3.4.2 REGULATORY MECHANISMS TO REQUIRE EROSION AND SEDIMENT CONTROLS

BMP 1– Provide written contractor and site developer notification.

Measurable Goal 1 – by the end of PY 1, Bangor will develop and implement a mechanism to provide notification to any person who intends to disturb one or more acres of State and municipal permitting requirements.

Commercial/Institutional projects developing one or more acres receive site plan review and are therefore appraised of State and municipal permitting requirements prior to approval. Single family residential properties one acre or more are verbally informed of permitting requirements.

BMP 2– Develop and implement a system to annually track all activities that disturb one or more acres.

Measurable Goal 1 – In PY 1 Bangor will implement a tracking system to record every activity that disturbs one or more acres. Note: this system must track and differentiate construction activities within urban impaired stream (UIS) watersheds; the priority watershed(s) and all other watersheds. The system will be used to summarize data. The summaries will be included in annual reports submitted to the DEP.

Bangor Code Enforcement/Development Coordinator oversaw construction of 21 different projects and recorded a total of 37 inspections during the permit year between from 6/30/08 and 7/1/09. Sixteen (16) of the projects were one acre or more in size. The results of the inspections were recorded in the Stormwater

Steward Database. Photos of the 3 page summary report of the inspections is pasted below. The full details of the inspections can be viewed in the Stormwater Steward Database.

Inspections

Construction

Site/Inspector/Inspection Date			Areas Currently Under Construction/Disturbance (acres)	Areas of Repeated Non-compliance that require MDEP Notification	Catch Basin/Storm Drain System	Culverts/Riprap
Affiliated Healthcare	bangorceo	8/20/2008	.25 acres	No	N/A	N/A
Atlantic Investments	bangorceo	7/10/2008	1 acre	No	N/A	Pass
BFD station #6	bangorceo	10/22/2008	.5 acres	No	N/A	N/A
		11/11/2008	.5 acres	No	Pass	Pass
Charles Taylor	bangorceo	7/28/2008	.5 acre	No	N/A	N/A
		8/13/2008	.5 acres	No	N/A	N/A
Courthouse - Maine Adminsitrative Office of the Co	bangorceo	7/9/2008	less than an acre	No	Fail	N/A
		11/12/2008	less than an acre	No	Pass	N/A
Courtyard - Marriot	bangorceo	7/9/2008	1 acre	No	Pass	Pass
Crossroads Plaza & 30 Kittredge Road	bangorceo	5/20/2009	1 acre	No	N/A	N/A
Husson College	bangorceo	9/17/2008	2 acres	No	Pass	Pass
Jori Brothers - Curtainshop	bangorceo	12/9/2008	1 acre	No	Fail	Fail
		12/16/2008	1 acre	No	Pass	Pass
		1/13/2009	1 acre	No	Pass	Pass
		3/26/2009		No	N/A	Fail

Site/Inspector/Inspection Date			Areas Currently Under Construction/Disturbance (acres)	Areas of Repeated Non-compliance that require MDEP Notification	Catch Basin/Storm Drain System	Culverts/Riprap
Jori Brothers - Curtainshop	bangorceo	4/29/2009	.5 acre	No	Pass	Pass
		6/24/2009	None	No	Pass	Pass
Lead Mountain Properties	bangorceo	5/6/2009	.5 acres	No	N/A	N/A
Meadwobrook Ridge LLC	bangorceo	6/30/2008	1 acre	No	Pass	Pass
		7/21/2008	.5 acres	No	Pass	Pass
		10/9/2008	.5 acres	No	Pass	Pass
Palace Realty - Lambs Bookstore	bangorceo	12/9/2008	.25 acres	No	N/A	Pass
Perry & Morrill	bangorceo	10/15/2008	1 acre	No	Pass	N/A
		10/22/2008	1 acre	No	N/A	N/A
Ralph McPherson	bangorceo	9/30/2008	.5 acres	No	N/A	N/A
		10/7/2008	.5 acres	No	N/A	N/A
Ross Manor - 1st Atlantic	bangorceo	7/8/2008	.5 ACRES	No	N/A	Pass
TBA Inc	bangorceo	7/8/2008	.5 acres	No	N/A	N/A
Tim Horton's	bangorceo	8/13/2008	1 acre	No	Pass	Pass
Varnbro - Merrill Bank	bangorceo	7/17/2008	1 acre	No	Pass	Pass
Vaughn Thibodeu & Sons	bangorceo	10/7/2008	2	No	Pass	Pass
		12/17/2008	3 acres	No	Pass	Fail
Walmart	bangorceo	6/30/2008	0	No	Pass	Pass
		7/2/2008	10 acres?	No	Pass	Pass
		8/13/2008	10 acres	No	Pass	Pass

Site/Inspector/Inspection Date			Areas Currently Under Construction/Disturbance (acres)	Areas of Repeated Non-compliance that require MDEP Notification	Catch Basin/Storm Drain System	Culverts/Riprap
Walmart	bangorceo	11/12/2008	10 acres	No	Pass	Pass
Webbs RV - Target	bangorceo	7/8/2008	3 acres	No	N/A	N/A
		4/22/2009	.25	No	N/A	Pass

BMP 3 – Develop and implement a construction site inspection program.

Measurable Goal 1 – Bangor will develop a procedure for construction site inspections by either a municipal official or a contracted third party to meet the terms and conditions of the MS4 General Permit by the end of PY1.

Bangor uses a municipal employee – the Development Coordinator from the Code Enforcement office has the responsibility to inspect construction projects.

Measurable Goal 2 – Bangor will develop a procedure to ensure that all construction sites of one

acre or more within the watersheds of Bangor's priority urban impaired streams are inspected at least three times with one inspection at project completion to ensure that all post construction BMPs were properly installed.

In accordance with Chapter 500, it is the policy of our Development Coordinator that all projects should receive three inspections – regardless of where they are located in the City. The first inspection reviews erosion control and the second or more inspections are conducted randomly throughout the project to ensure continued effectiveness of BMPs, and the final inspection verifies that the certificate of compliance is correct and that BMPs are working. Projects approved by planning board including (but not limited to) those that are an acre or more are required to submit a certificate of compliance upon completion and prior to issuance of certificate of occupancy that the project was constructed per the approved plan. This includes stormwater infrastructure and BMPs.

Measurable Goal 3 – Bangor will develop a standardized inspection form to ensure documentation of all required inspections by the end of PY 1.

Bangor uses the standard form that resides in the Stormwater Steward Database to document inspections.

Measurable Goal 4 – Bangor will develop a process for tracking and notifying the site developer or contractor of noncompliance issues by the end of PY1.

The Code Enforcement/Development Coordinator tracks projects through Stormwater Steward Database and notifies developers personally when they do not comply. Steward database includes a check box to identify where follow up is needed.

Measurable Goal 5 – Bangor will develop and implement (as needed) a training program for municipal inspectors by the end of PY1. For sites that are not in compliance, the inspector(s) will provide site operators with guidance on how to come into compliance. Sites that are not brought into compliance within the inspector's specified time period shall be issued a written notice of violation. Continued noncompliance will be reported to the DEP with supporting documentation.

Most of the contractors we encounter are fully aware about how to come into compliance and have attended the State Erosion Control class. Those contractors only need a friendly reminder and a return visit. Others who are not aware of soil erosion control practices are provided with State published erosion and sedimentation control guidance.

Bangor has recorded inspection results in the Stormwater Steward database management system, as required, and a summary is included above

Responsible party – Code Enforcement Development Coordinator

3.4.3 DEVELOP AND IMPLEMENT LID STRATEGIES

BMP 1 – Develop and implement LID strategies.

Measurable Goal 1 – In PY 1 Bangor, in cooperation with the BASWG, will continue to support the existing LID related projects currently underway in Hampden and Bangor, and continue to identify approaches to promote low-impact development on a regional basis.

The City followed up on its newly adopted Leadership in Energy and Environmental Design (LEEDS) Policy by designing and building the new Fire Station 6 to LEED standards. The design included LID stormwater treatment systems such as buffers and a bio-retention system. An Education and outreach program will be part of the building promotion and will be completed in PY2.

Bangor also collaborated with the BASWG on several other LID projects. Please Refer to BASWG SWMP PY1 Report, pg. 32 for summary.

Responsible party – Bangor Cluster MS4 Storm Water Program Coordinators.

Measurable Goal 2 – By PY 2–5 Bangor will evaluate its existing land development code to determine if additional LID practices are appropriate.

Permit year 1 – Bangor Stormwater staff in cooperation with Bangor Planning Director conducted an in-depth survey of our existing land development code and what LID practices may be able to be implemented. We anticipate that in Permit Year 2 – 5 we will move recommendations to the Planning Board for discussion and potential amendments to the code.

Measurable Goal 3 – In PYs 2-5 Bangor, in cooperation with the BASWG will seek opportunities to evaluate, promote and implement additional LID strategies in the Bangor urbanized area.

Not applicable in Permit Year 1.

Responsible party – Bangor Stormwater Program Coordinators.

MINIMUM CONTROL MEASURE 5
POST-CONSTRUCTION STORMWATER MANAGEMENT

3.5.1 MCM GOALS

- Develop a program to address stormwater runoff from new development and redevelopment projects that disturb areas greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4;
- Implement an ordinance or similar measure to ensure adequate long-term operation and maintenance of post construction BMPs;
- Ensure post construction BMPs are functioning as intended; and
- Document and report annually to the MDEP all applicable post-construction related information.

For specific General Permit requirements and suggestions, refer to MDEP's General Permit for the Discharge of Stormwater from Small Municipal or State or Federally Owned Municipal Separate Storm Sewer Systems Part IV(H)(5).

3.5.2 - IMPLEMENT POST-CONSTRUCTION RUNOFF CONTROL ORDINANCE

BMP 1- Bangor will adopt a model post-construction runoff ordinance developed for regulated MS4s.

Measurable Goal 1 – In PY 1 Bangor will adopt the model ordinance or other DEP approved measure.

The process to develop and enact a Post-Construction Ordinance was undertaken in Permit Year 1, and was concluded in early Permit Year 2.

The Ordinance, Enacting Chapter 268, titled, Stormwater, of the Code of Ordinances, Requiring Stormwater System Inspection and Maintenance and Annual Reports, and Amending Chapter 165, Section 165-43, titled, Stormwater Runoff, received Bangor City Council approval on August 24, 2009, and became effective ten days later on September 3, 2009.

The Ordinance can be found on the City's website (www.bangormaine.gov) under "Code of Ordinances".

Measurable Goal 2 – By June 30, 2009, Bangor will implement a post construction discharge ordinance or similar measure that ensures long term operation and maintenance of post-construction BMPs.

The Ordinance received Bangor City Council approval on August 24, 2009, and became effective ten days later on September 3, 2009. The ordinance will be implemented by individual property owners and enforced by the City's Code Enforcement Officers.

Measurable Goal 3 – In PYs 2-5 Bangor will implement the post-construction ordinance.

The Post Construction ordinance will be implemented by individual property owners and enforced by the City's Code Enforcement Officers.

3.5.3 POST CONSTRUCTION SITE INSPECTION AND MAINTENANCE

BMP 1 – Develop and implement a post-construction inspection program

Measurable Goal 1 – In PY 1 evaluate the benefit of a regional approach to performing post-construction inspections as a cost saving measure, in order to maintain consistency, and to ensure that the inspections are being performed as necessary. A plan for implementing a regional approach will continue to be evaluated in the early stages of the current General Permit.

Bangor collaborated with the BASWG on this project. During the Summer of 2008, the BASWG contracted with Evan Richert to conduct an analysis of whether or not a regional approach to post-construction inspections would be beneficial.

During this project, each of the BASWG municipalities were inventoried for all projects that had been permitted from 2003 to 2007 that disturbed one or more acres of land. These were categorized by (1) type and size of project, (2) within versus outside of the urbanized area, and (3) by within the watershed of an urban impaired stream versus outside of such a stream. It was not possible, from the information available, to easily determine whether a project drained directly to state waters or otherwise did not enter an MS4 and thus would be exempt from post-construction monitoring. The resulting data was compiled, showing the number of projects that disturbed 1 or more acres in urbanized area and urban impaired stream watershed 2003-2007 for BASWG MS4 Municipalities.

	Urbanized Area		**Urban Impaired W'shed**	
	Yes	**No**	**Yes**	**No**
Bangor	108	0	46	62
Brewer	27	0	0	27
Hampden	2	19	0	21
Milford	0	3	0	3
Old Town	4	0	0	4
Orono (excl. UM)	8	7	0	15
Veazie	0	0	0	0
TOTALS	149	29	46	132

A discussion about the findings of the P-C inspections study took place at the BASWG's August 2008 meeting. Because such a large majority of projects occurred in Bangor, and because Bangor also contained all of the projected within urban impaired watersheds that will require municipal inspections in any case; and because, conversely, modest numbers of triggering projects occurred in the other municipalities (with Brewer the primary exception, and potentially Hampden if the monitoring program applies in both urbanized and non-urbanized areas of town), the general consensus was that, at least for the time being, a municipal-by-municipal approach made the most sense. Therefore, the regional approach was not pursued further, although it remains an open possibility if, once experience is gained with the new post-construction monitoring requirements, such an approach appears to be advantageous.

Measurable Goal 2 – In PY 1 Bangor, in cooperation with the BASWG, will work together, where possible, to develop an inspection program for post-construction BMPs.

Because the analysis indicated no major benefits to a regional approach at this time, the BASWG did not work on the development of a regional inspection program. However, Maine DEP will be conducting a training to certify qualified inspectors. Members of the Penobscot County Soil and Water Conservation District will take part in this study and become a regional location for trained inspectors. The BASWG is planning to encourage contractors to utilize the District's certified inspectors.

MINIMUM CONTROL MEASURE 6
POLLUTION PREVENTION/GOOD HOUSEKEEPING

3.6.1 MCM GOALS

- Develop an inventory of all municipal operations conducted in, on, or associated with facilities, buildings, golf courses, cemeteries, parks and open space owned or operated by regulated MS4s that have the potential to cause or contribute to stormwater or surface water pollution.
- Develop and implement written operation and maintenance procedures for applicable facilities in its highest priority watershed that include maintenance schedules and inspection procedures to ensure long term operation of structural and non-structural controls that reduce stormwater pollution to the maximum extent practicable.
- Develop and implement operation and maintenance procedures for applicable facilities in the remaining watersheds within the Urbanized Area.
- Prevent the accumulation of sediment by developing a program to sweep all publicly accepted paved streets and publicly owned paved parking lots as well as cleaning catch basins and other stormwater structures.
- Develop a Stormwater Pollution Prevention Plan (SWPPP) for applicable facilities which will outline sources of potential stormwater pollutants and the methods by which these pollutants will be reduced or prevented from entering Waters of the State.

For specific General Permit requirements and suggestions, refer to MDEP's General Permit for the Discharge of Stormwater from Small Municipal or State or Federally Owned Municipal Separate Storm Sewer Systems Part IV(H)(6).

3.6.2 OPERATIONS AT MUNICIPAL GROUNDS AND FACILITIES

BMP 1 – Evaluate existing facilities and operations.

> *Measurable Goal 1 – By the end of PY 1, Bangor will take an inventory of all municipally owned grounds and facilities in order to identify potential stormwater pollutants.*

Following is the City of Bangor Facilities Inventory categorized by watershed:

WATERSHED	DESCRIPTION
Arctic Brook	Bangor Gardens Park Grounds and Facilities
Arctic Brook	Bangor High School
Barkersville	**Armory Bldg.(Parks & Rec)**
Barkersville	Fairmount Park Grounds and Facilities
Bass Park	Bangor Auditorium/Civic Center
Bass Park	Bass Park-Cattle Barn Facilities
Bass Park	Bass Park-Grandstand / Racetrack
Bass Park	Bass Park-Horse Barn Facilities
Bass Park	Bass Park-Sheep Barn Facilities
Bass Park	Golf Course Grounds and Facilities

Bass Park	Paul Bunyan Park Grounds and Facilities
Bass Park	Bass Park Open Space
Birch Stream	Airport Buildings
Birch Stream	Airport Fuel Farm Facility
Birch Stream	Airport Grounds and Facilities
Birch Stream	Bus/Garage/Recycling
Birch Stream	Park Woods Housing Complex
Birch Stream	Union Street Athletic Field Grounds and Facilities
Birch Stream	Public Works Facility
Birch Stream	Fleet Maintenance Facility
Birch Stream	Cemetery Pine Grove Hammond Street
Capehart	Downeast School
Carr Brook	Cameron Field Grounds and Facilities
Carr Brook	Fruit Street School
Carr Brook	William Cohen Middle School

Central	City Hall
Davis Brook	Fire Station Central Main Street
Davis Brook	Hayford Park-Sawyer Arena
Davis Brook	New Police Station
Davis Brook	Davenport Park-Grounds and Facilities
Davis Brook	Second Street Park Grounds and Facilities
Davis Brook	Waterfront Park Grounds and Facilities
Davis Brook	Fifth Street Middle School
Davis Brook	Vine Street School
Davis Brook	Fairmount School
Fourteenth	Hayford Park-Mansfield Complex
Fourteenth	Hayford Park-Pancoe Pool Facility
Fourteenth	Fourteenth Street School
Fourteenth	Hayford Park Grounds and Facilities
Franklin	Pierce Memorial Park Grounds and Facilities
Hancock	Williams Park Grounds and Facilities
Hancock	Fire Department Hose 5 Museum
Hancock	Learning Center
Hancock	Chapin Park Grounds and Facilities
Hancock	Abraham Lincoln School
KD West	Columbia Street Parking Deck
KD West	Pickering Square/Parking Garage
KD West	Storage Garage Court Street
KD West	Coe Park Grounds and Facilities
KD West	Kenduskeag Pump Station
Kenduskeag	Hannibal Hamlin Mall Grounds and Facilities
Kenduskeag	Kenduskeag Stream Park Grounds and Facilities
Kenduskeag	Norumbega Mall Grounds and Facilities

Meadowbrook	Dakin Park-Pool Facilities
Meadowbrook	Rec. Area-Ski Lodge
Meadowbrook	Broadway Park Grounds and Facilities
Meadowbrook	Dakin Park Grounds and Facilities
Meadowbrook	Little City Park Grounds and Facilities
Meadowbrook	Stillwater Park Grounds and Facilities
Meadowbrook	Mary Snow School
Oak Grove	Cemetery Oak Grove Finson Road
Penjajawoc	Fire Station #5 Hogan Road
Penjajawoc	Cemetery Mt Hope City Portion
Penjajawoc	K Mart Pump Station
Pushaw	Cemetery Maple Grove Pushaw Road
Shaw Brook	Warehouse Hildreth Street
Shaw Brook	Hildreth Street Pump Station
Strickland	Fire Station New
Strickland	Fire Station No. 6
Sucker Brook	Fire Department Training Ctr.
Sucker Brook	Odlin Road Pump Station
Sucker Brook	Perry Road Pump Station
Woodlawn	Cascade Park-Grounds and Facilities
WWTP	Waste Water Treatment Plant Complex

3.6.3 MUNICIPAL EMPLOYEE TRAINING

BMP 1 – Develop employee training program.

Measurable Goal 1 – By the end of PY 1 Bangor, in cooperation with the BASWG, will identify training needs and materials for MS4 staff regarding O and M procedures.

The BASWG discussed training needs and goals during PY1 for MS4 staff regarding O & M procedures for municipal or facility operations. No trainings were planned or implemented by the BASWG for its members for PY1. However, during PY2 the BASWG anticipates the following training sessions to either develop regionally or participate in statewide programs;

- Erosion and Sediment Control Measures;
- MS4 Program Data Management using **Storm Water Steward** (continued);
- SWPPP Development and Implementation; and
- Municipal Facility Pollution Prevention Auditing.

3.6.4 STREET SWEEPING

BMP 1 – Develop and implement street sweeping program.

Measurable Goal 1 - By the end of PY 1, Bangor will revise an existing program that addresses

the sweeping of streets and parking lots owned and operated by the City as soon as possible after snowmelt.

Bangor has been sweeping its streets and parking lots under its Combined Sewer Overflow (CSO) Control Program for over twenty years using two street sweepers. The priority areas have been the Downtown Streets and parking lots to both comply with air quality standard requirements and to sweep winter sand used on the hilly terrain. All City streets and parking lots are swept at least once annually. This year City streets in the two priority urban impaired watersheds (Birch and Penjajawoc) were given the next highest priority after the downtown area.

In Permit Year 1, Bangor ordered a new $250,000.00 state of the art street sweeper as recommended by DEP water quality staff. The unit was paid for by money allocated through the SRF program as part of the American Recovery and Reinvestment Act of 2009. The new unit was placed into service in August 2009.

The street sweeping report is made annually for the calendar year for the CSO Report. The 2008 report follows:

2008 Sweeping Report

Sweepings	925 yards
Sweeping Man hours	2275 man hours
Miles swept	4350 miles

3.6.5 CLEANING OF CATCH BASINS AND STORMWATER STRUCTURES

BMP 1 – Develop and implement stormwater infrastructure cleaning program.

Measurable Goal 1 - By the end of PY 1, Bangor will revise an existing program that addresses the evaluation of and if necessary, the cleaning of catch basins and other stormwater structures owned and operated by the City.

Bangor has been inspecting and cleaning catch basins under its Combined Sewer Overflow (CSO) Control Program for over twenty years. The priority areas are hills and the bottom of hills where winter sand use is more heavily applied and likely to settle out.

The City's catch basin cleaning equipment is old and inefficient. It currently uses a clam type attachment on the back of a truck and an old sewer cleaning truck that was handed down from the sewer department. In order to meet the goal of the permit to clean every basin once every other year – the City will need to increase its capacity to clean basins by 6 times. Two new catch basin cleaning trucks would increase the efficiency and manner the ability to meet this permit requirement. The cost of a new truck is $225,000. The new truck request will be requested in upcoming vehicle replacement and stormwater budgets, but is unlikely to be funded in the very near future. The Catch Basin Cleaning report is made annually for the

calendar year for the CSO Report. The 2008 report follows:

2008 Catch Basin Report

Catch Basins Cleaned	520
Catch Basin Debris	76 yards

3.6.6 MAINTENANCE AND UPGRADING OF STORMWATER CONVEYANCES AND OUTFALLS

BMP 1 – Prioritization of stormwater conveyance, structure and outfall maintenance.

> *Measurable Goal 1 - By the end of PY 5 Bangor will evaluate and implement a maintenance schedule for conveyances, structures and outfalls owned and operated by the City.*

Responsible Party – Public Works Director

Permit Year 1 – The Public Works Facility was the highest priority for upgrade of stormwater conveyance systems this year. They completed a replacement of 17 catch basins within their stockyard and vehicle storage area at a cost of approximately $93,000.00. The improved catch basins have sumps and the capability of installing filtration systems. Two types of filtration systems will be tested in PY2 for use in all basins.

In general, replacement is performed on an as-needed basis and in conjunction with other projects where appropriate to save on costs. The concept of a preventative maintenance plan for such assets is being discussed occasionally, but the need for funding for additional planning and construction is a limiting factor.

3.6.7 MUNICIPAL FACILITY AUDITS

BMP 1 –Assess stormwater pollution potential from applicable facilities identified in the General Permit.

> *Measurable Goal 1 - By the end of PY 1 Bangor will inventory all applicable facilities within its regulated area and determine which facilities require auditing for pollution prevention. Bangor will collaborate with the BASWG and DEP to develop an audit training program for municipal facilities and schedule audits.*

Bangor inventoried its municipal facilities in Permit Year 1. The inventory listing can be found in Section 3.6.2 of this Report. Audit determinations are highlighted in yellow.

In Permit Year 1 the BASWG discussed with DEP staff a collaborative audit training program to be implemented in Permit Year 2. This program would involve DEP stormwater inspectors that regularly

perform inspections of industrial and municipal facilities to identify pollution prevention issues. DEP staff and BASWG anticipate scheduling an audit training program by the end of 2009 for a demonstration facility yet to be chosen. The training attendees can then perform their own facility audits to identify pollution prevention issues.

Measurable Goal 2 - By the end of PY 2 Bangor will conduct municipal facility audits for all facilities included on the inventory from PY 1.

Permit Year 1 – The largest facilities on our audit list are already being audited for stormwater pollution prevention on various levels in accordance with their stormwater or spill prevention plans. Those facilities that have not been audited are the fire stations, pump stations, and the cemeteries and parks.

SECTION 5 – URBAN IMPAIRED STREAMS PLAN

INTRODUCTION

Additional stormwater treatment controls within the Urbanized Area (UA) are necessary for Urban Impaired Stream watersheds. For discharges from the permittee's infrastructure and operations within the UA to an Urban Impaired Stream, the permittee shall implement measures necessary to control, to the maximum extent practicable, the discharge of stormwater runoff including known pollutants of concern. Pollutant(s) of concern refer to the pollutant(s) identified as causing or contributing to the waterbody's impairment. Urban runoff may be used as a surrogate pollutant of concern where information is lacking on specific causes of impairment.

Bangor has five currently listed Urban Impaired Streams. Listed below in order of priority, they are:

1. Penjajawoc Stream
2. Birch Stream
3. Arctic Brook
4. Shaw Brook
5. Capehart Brook

The following are the action items that have been identified to potentially improve water quality in streams impacted by stormwater runoff for Permit Year 1.

5.1 PERMIT YEAR ONE – December 29, 2008 – June 30, 2009

5.1.1 ACTION ITEMS AFFECTING ALL STREAMS

Most ordinances, staff changes, administrative policies, training and educational outreach activities will affect property owners and citizens in every watershed of the City, not just one. Those action items are listed below.

A. Education/Outreach and Public Participation (MCM 1 and MCM 2)

i. Create a City web page for environmental and stormwater related news (including stormwater information and updates). To be maintained through permit year 5.

In Permit Year 1, Bangor added a "Stormwater" page to the City website (www.bangormaine.gov). Click on the STORMWATER button on the left side of the homepage. The Stormwater Page is divided into watersheds and each watershed has descriptions of the documents related to it and links to those documents. The documents are arranged in chronological order for Birch Stream and will be arranged in that manner for Penjajawoc Stream in Permit Year 2.

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ii. Publish an Environmental and Stormwater newsletter bi-annually.

In Permit Year 1, Bangor published an environmental / stormwater newsletter called "The RUNDOWN". The first issue can be found on the STORMWATER page of the City Website. The link is "The RUNDOWN Newsletter May 2009". In permit year 2 the newsletter will be

published in November, 2009 and May 2010.

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iii. Submit articles that discuss stormwater as it relates to human health to the regional health improvement outreach coordinator.

An article describing health issues related to dog waste left in the yard was published in the December issue of "What You Do Matters" a newsletter "For Healthy Living in Eastern Maine Communities". This newsletter goes out to approximately 8,900 people via e-mail and hard copy and is sponsored by the Bangor Region Public Health and Wellness and the City's division of Health and Community Services.

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iv. Enclose stormwater message in water/sewer bills each permit year.

Bangor sent out 'Sustainability Starts at Your Sink – How to Dispose of Household Waste'. The bill stuffer was produced by the Water Environment Federation (WEF), item number HS1804. The information focused on how to dispose of household waste featuring a chart that lists many household wastes and the proper disposal of such. Ten thousand bill stuffers were purchased and mailed at a cost of $1,050. They were enclosed in the water/sewer bills for the billing quarter beginning January 1, 2009.

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v. Hire a consulting firm to make recommendations for set up, administration, and implementation of a stormwater utility.

The City was awarded 319 funding through DEP to contract with CH2MHill to update a rate study previously written for Bangor in 1994. The updated rate study was completed in May, 2009. Using the Birch Stream Watershed as a model, the report provided the City with a cursory estimate at how much revenue could be generated. Also, see response to (vi.) below.

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vi. Consider retaining a consultant to conduct stormwater utility feasibility (DIMS) study.

The City partnered with the Bangor Area Storm Water Group (BASWG) and the Maine Department of Environmental Protection *DEP) to retain AMEC, a consulting firm specializing in implementation of Stormwater Utilities, to present an introductory feasibility workshop on June 26, 2009. The complete DIMS Workshop Report can be viewed on the City's Website on the STORMWATER Page.

In March the City submitted a proposal to the DEP for funding under the 604B program for ARRA funds for the purpose of conducting a feasibility study and develop a public outreach plan. The proposal was awarded $70,000.00, and the project will take place Permit year 2 through 3.

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vii. Hold one or more public education meetings to inform the public about funding options and stormwater utility recommendations.

A public meeting was held with City Council Members on 12/17/09 to provide them with overview of stormwater issues, including the need for funding, and an information packet was provided to the Council on 2/27/09

Birch Stream watershed stakeholders attended a public meeting on 2/19/09 that introduced them to stormwater concerns, the need for planning, including recognition of the need for new sources of revenue.

Two public meetings were held with stakeholders on the Penjajawoc Stream watershed on 2/27/09 and 3/20/09 which included discussions about funding strategies.

An introductory stormwater meeting was held with the newly organized Penjajawoc Citizen Review Panel (CRP) on 4/1/09 to familiarize them with stormwater pollution concerns leading up to the need for a sustainable funding source.

A tour of Penjajawoc Watershed and a demonstration of stormwater treatment systems was conducted on June 13, 2009 for members of the Bangor Land Trust.

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viii. <u>In addition to the items included in the permit above</u>, the City also discussed yardscaping tips with the General Electric Company employees at their annual Environmental and Safety Picnic.

The Environmental Coordinator borrowed the BASWG Yardscape booth and met one on one with over 100 employees from General Electric on Oct. 14, 2008.

B. Construction and Post Construction (MCM 4 and MCM 5)

i. Evaluate an ordinance requiring contractors to be certified in soil erosion and sedimentation control under the State's certification program.

The City's Stormwater Committee discussed such an ordinance and determined it would be best to ease into this type of requirement by first requiring it of every contractor who is hired to do work for the City. The latter will be accomplished through the purchasing department through a City proclamation in permit year 2.

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ii. Begin educating City Public Works, Recreation, Engineering, Code Enforcement and Airport Environmental staff on soil erosion and sedimentation control practices and procedures.

The City sent four of its key employees to the University of New Hampshire Stormwater Research and Demonstration workshop on October 28, 2008.

Training by Maine DEP in soil erosion and sedimentation control is scheduled for December,

2009.

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iii. Promote Stormwater Pollution Prevention awareness by all City staff (Permit year one through five).

Permit Year 1 - Stormwater pollution prevention has been included in the annual training of applicable employees of the Airport, Public Works, Fleet Maintenance, and the Parks & Recreation Department since 2005. The training presentation is updated each year to include recent concerns and new protocols and procedures. Actual Training events were held on the following dates:

Bangor Area Transit Bus Drivers (30 staff)

Bangor International Airport (300 staff) Jan. – Apr. 2009

Bangor High School Teachers – (21 staff) Jan. 27 and May 5, 2009

Bangor School District Custodians (30 staff) – Nov. 10, 2008

Doughty Middle School (11 staff) – Oct. 21, 2008

Fleet Maintenance (16 staff) – Jul. 16, 2008 and Jun. 9/10, 2009

Public Works (49 staff) – Apr. 14, 2009

Additionally, the City sent six (6) key employees to a SPCC workshop on June 16, 2009 sponsored by the Bangor Area Stormwater Group (BASWG).

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iv. Purchase a portable computer with GPS for Code Enforcement to record notes in the field.

This item was purchased for the Code Enforcement/Development Coordinator in Permit Year 1 through a formalized Stormwater Improvement budget. This has greatly enhanced his ability to record inspections into the Stormwater Steward database remotely.

C. Pollution and Prevention and Good Housekeeping (MCM 6)

i. Evaluate cost/benefit of adopting ordinances pertaining to improved stormwater management such as the following:

Expanded buffers ***(Partially complete)***

Sand/salt management

Pesticide use near streams

Prohibition of coal tar sealant

Good housekeeping (litter, dumpsters, vehicle washing, etc.)

LID integration with subdivision plans ***(Partially complete)***

Increase stormwater regulations for properties less than 1 acre in area. ***(Partially complete)***

Permit Year 1 - The Post Construction ordinance includes properties where there is less than 1

acre of area. Expanded buffers were considered by the Planning Board as a result of the States new Resource Protection zoning requirement. A full review of all LID recommended ordinances was conducted and a list of priority changes was created to be considered by the Planning Board in PY2.

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ii. *Evaluate the need for increased or modified street and parking lot sweeping and cleaning in priority watersheds.*

Street sweeping was focused on priority watersheds as soon as the downtown district was completed (considered the highest priority) in Permit Year 1.

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iii. *Publish Snow Dump Tips to include recommendations for preferred placement, proper application and storage, and alternatives to salt use.*

There was no formal activity on this item in Permit Year 1. Snow dumps (contaminated with litter, sand and salt) continue to be a problem in urbanized areas where space is limited, transportation to outside areas is costly, and dump areas drain to streams in most cases. The Stormwater staff will attempt to develop and publish the "tips" brochure before December of Permit Year 2.

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iv. *Identify/seek opportunities to gain control of properties that abut streams (through easements or ownership) where appropriate. (Permit year one through five).*

Permit Year 1 - Several construction projects of stormwater treatment systems were funded through the American Recovery and Reinvestment Act. As a result, several projects located on private property in the Penjajawoc were negotiated with property owners to include City stormwater easements in Permit Year 1 and 2. The largest of these projects was the Bangor Mall owned by Kravco Simon Company.

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v. *In addition to those items mentioned in the Permit, the City also provided opportunities for the general public to recycle or properly dispose of hazardous waste.*

Bangor hosted the annual regional household hazardous waste drop off event on October 2, 2008 which brought in 421 Bangor households making up 38% of the total number of participants. In addition, residents brought 843 computer monitors and/or televisions to Public Works for recycling during the four weekends of Spring Clean Up in April and May, 2009.

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vi. *In addition to those items mentioned in the Permit, the City also conducted Hazardous Waste Pick ups from various facilities located throughout the City.*

Bangor now exceeds the RCRA requirements for Hazardous Waste Removal once every 90 days for large quantity generators, and ensures that each small quantity generator facility has at least one pick up per year. Pick ups occurred on: 9/3/08, 12/31/08, 2/24/09, 5/13/09.

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vii. *In addition to those items mentioned in the Permit, the City Fleet Maintenance Department also developed and implemented a General Industrial Stormwater Permit and SOPs as per DEP requirements.*

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viii. *In addition to those items mentioned in the Permit, the Bangor International Airport (BIA) participated as a member of the Penobscot River Oil Pollution Abatement Committee (PROPAC).*

BIA Tank Farm and Facilities store millions of gallons of petroleum product, and therefore chooses to participate in PROPAC by sending at least two employees to every monthly meeting and participating in annual real-life drills.

The EPA conducted a surprise inspection in July, 2009 and found the Tank Farm operations to be in good standing.

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ix. *In addition to those items mentioned in the Permit, the City shared it's experiences as a collaborative partner with the Bangor Area Stormwater Group at the New England Interstate Water Pollution Control Commission (NEIWPCC) Non-Point Source Conference in Portland, ME on May 19, 2009.*

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x. *In addition to those items mentioned in the Permit, the City formed a Stormwater Committee made up of staff from various departments in order to encourage more efficient collaboration of effort between departments.*

A very modest budget was also established at about $70,000 based upon previous years expenses. Meetings are held monthly or bi-monthly were possible and serve to update every member of the status of projects, expectations regarding this MS4 permit, and any other related information.

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xi. *In addition to those items mentioned in the Permit, the City prepared preliminary and final proposals to the National Civilian Community Corps (NCCC) Americorps for a team of volunteers to perform work on streams in Bangor in March, 2009. The successful proposal brought about a large list of action items and coordination in order to prepare for the arrival in August.*

5.1.2 PENJAJAWOC STREAM WATERSHED

A. Work toward City Council adoption of the Penjajawoc Stream Watershed Management Plan.

During development of the Watershed Management Plan, one of the largest difficulties was in summarizing the water quality data that had been already gathered and determining what information we could glean from the data as well as what data was missing for future decision making. A group of stakeholders insisted on securing a third party consultant to review and summarize the existing data and provide a gap analysis. CH2MHill performed that work for the City and concluded that the City should collect flow monitoring data to in order to calibrate all previous and future stormwater analysis and models. The report also made recommendations as to what models should be considered for use in future stormwater planning. Two public meetings were hosted by the City in support of CH2MHill's efforts on Oct. 9, 2008 and Feb. 26, 2009.

Another difficulty the City found was that of efficiently requesting and receiving formal citizen input. City staff appealed to the City Council for formation of a formal Citizen Review Panel (CRP) which was formally adopted by City Council with members formally elected by the Council in PY1. The first few meetings were planned to introduce the CRP to the complexities surrounding stormwater and management of it.

The CRP will review DEP recommendations for the Penjajawoc Watershed Management Plan and provide support in the development of a plan that is acceptable by the City, the citizens, the DEP and the Council. It is expected that the plan will be approved by DEP and adopted by Council during Permit Year 2.

B. Assist / support implementation/construction of one or more BMP retrofits.

Bangor sought and was **awarded $800,000.00** in ARRA Stimulus Funding through the SRF loan program to design and construct several of the highest priority water quality improvement projects on public and private properties in the Penjajawoc Stream Watershed. Design and construction of these projects are anticipated to occur in the fall of 2009. The project descriptions are listed below:

Water Pollution Abatement ,Bangor Mall By Pass

The existing Bangor Mall Storm Drainage system will be modified within the Bangor Mall Blvd. Right of Way to create a dry weather ground water discharge point directly into the stream. The modification would divert clean, cool ground water which currently flows continuously into the Mall's retention basins to the stream. This would serve to help maintain a base flow and keep the water at a more natural temperature, as well as avoid possible contamination from waters being detained in the pond.

Bio-Filtration, Green Infrastructure, Mid Maine Mall/K-Mart

Remove impervious cover on an existing road next to K-Mart. Construct a bio-filtration or subsurface wetland to treat stormwater from the opposite side of Hogan Road and from K-Mart. Replace one lane of road with porous pavement. Retrofit dry pond, and install

tree box filtration systems. Project will increase green infrastructure by improving pollutant removal and decreasing temperature from one of the most critical areas of the Penjajawoc watershed. This project will also serve as a demonstration site in a highly visible area of the Bangor Mall Complex.

Autopark Pollutant Removal Treatment System

Retrofit existing pond to treat additional sub-watershed, add level spreaders, and buffer system to treat discharge before reaching stream. Project will provide additional pollutant removal, treat new areas that are currently untreated, adding approximately 60% more treatment to three sub-watersheds.

Strip Mall Low Impact Retrofitted Parking

Install Bio-retention cell to collect stormwater from Stillwater Avenue, install tree filter boxes to remove pollutants from roof and parking, remove pavement and replace with porous parking or bio-filtration system. Project would remove pollutants and decrease temperature of stormwater drained to stream.

Signs for Raising Awareness of the Stream and Retrofits

Signs will be placed along the stream at critical areas where public access is easy and likely to occur. Signs will provide awareness of the stream and describe each of the BMPs being implemented and the anticipated outcome of each BMP.

C. Collaborate with Eastern Maine Community College (EMCC) and Dorothea Dix Psychiatric Center (DDP) to install SW BMP Demonstration site(s).

Permit Year 1 - The City supported EMCC by writing a grant proposal for several LID stormwater demonstration projects. The grant request was not successful, Later, however, many of the projects were installed by EMCC and those remaining to be installed were again submitted through under the American Recovery and Reinvestment Act (ARRA) projects for Penjajawoc and were awarded funding as an SRF loan. The EMCC **project received $60,000.00** and is described below:

EMCC Stormwater Filtration & Storage System

Install 18,000 sq ft of porous pavement in extended parking area, add floating island to retention pond, and tree box filters along pedestrian area. These retrofits will reduce total volume of stormwater, reduce the temperature and remove pollutants through low impact systems. These projects along with the work that has already been completed at EMCC will serve as an excellent suite of Low Impact Development Demonstrations which EMCC is ready to support and publicize through their existing network of business & education connections.

D. Continue to support Volunteer Stream Team monitoring.

The City paid for water quality analysis that could not be done in-house at DEP in order to assist the Stream Team in establishing a baseline calculation for conductivity and its equivalent in

chloride content. The City also summarizes and publishes highlights of the stream team findings in its bi-annual environmental newsletter.

E. Install additional water monitoring instruments (flow and temp meters) and establish data gathering program.

Bangor was ARRA Stimulus Funding through the SRF loan program to purchase, install, and maintain flow-temperature monitors in the Penjajawoc and Bangor's other 4 impaired streams. A contract was awarded to the James W. Sewall Company to install five monitors in the Penjajawoc watershed and additional monitors in the other four impaired streams in the City. The monitoring contract commenced in June 2009 and is anticipated to run for approximately two years.

F. Seek funding for design of in-stream restoration improvements.

The ARRA Stimulus Funding through the SRF loan program included money to design and construct several water quality improvement projects in the Penjajawoc Stream watershed. Design and construction of these projects are anticipated to occur in the fall of 2009. The projects are listed below:

Riparian and In-stream Improvements, Bangor Mall/Stillwater Avenue

Construct terraced banks and a deeper channel to remove braided stream bed. Add ripples and plantings and signage to restore the stream to a more natural system, reducing temperature, and supporting habitat. The site would be easily accessible by the public and would serve as a demonstration/educational site.

Enhance Riparian Corridors

Plant deciduous trees and shrubs along the Penjajawoc Stream between Stillwater Ave and I-95. This will increase Shading and woody debris in the stream and improve wildlife habitat (for biological improvement) and help to reduce the water temperature. This effort would involve civic and environmental groups interested in participating in the improvement of water quality of the Penjajawoc Stream. Volunteers would be trained to plant trees provided by the City.

G. Participate in Eastern Maine Community College annual Earth Day/Tech Day Clean-up event in May, 2009.

The City was unable to participate in this opportunity, as a result of too many other obligations, but has added it to the calendar for 2010 and has asked EMCC to also make a note to invite the City to participate in 2010.

H. Participate in Dorothea Dix Psychiatric Center Saxl Park Anniversary Celebration June, 2009.

This event was canceled, and no alternative opportunity was developed between the City and DDPC.

I. *In addition to those items mentioned in the Permit, the City formed an informal partnership with the Penobscot Job Corps (300) Students and Director.*

The Job Corps students successfully cleaned up streets and stream banks in the Birch Stream and Kenduskeag Stream Watersheds on Earth Day, April 22, 2009. Americorps student, Sarah Johnson and Environmental Coordinator, Wendy Warren provided a watershed briefing for the audience of 300 students and staff before they engaged in the clean up.

J. *In addition to those items mentioned in the Permit, the City collaborated with Maine DEP to conduct a thorough inspection of the closed landfill which is located at the headwaters of the Penjajawoc Stream.*

The DEP took water quality samples in support of the investigation and found no significant concerns.

5.1.3 BIRCH STREAM WATERSHED

A. Summarize, analyze, and publish water quality monitoring data from previous year. (To be completed permit year one through permit year five).

This item has been exceeded. Due to the award of American Recovery and Reinvestment Act (ARRA) funds, the City was able to hire consultants to collect and publish monthly summary reports of the monitoring results. In addition, we are working with DEP, BIA, and MEANG to develop a comprehensive approach to collect more robust water quality data and test for many more parameters then previously being done. This Memorandum of Understanding will become part of the Birch Stream Watershed Management Plan and is expected to be approved and implemented in Permit Year 1.

B. Complete design specifications for LID treatments for Airport conveyance systems at headwaters of stream.

See response to item D. below.

C. Hire a consultant and prepare a Watershed Management Plan for submission to DEP.

Bangor requested and was awarded a grant on June 23, 2008, in the amount of $90,000.00 from

the Maine Department of Environmental Protection to provide 319 funding assistance for the preparation and development of a Birch Stream Watershed Management Plan. Following the Request for Proposals procurement process, the James W. Sewall Company was contracted to prepare the Birch Stream Watershed Management Plan.

On Thursday, March 5, 2009 the City hosted a stakeholder meeting for the Birch Stream watershed management plan at the University College of Bangor. Turnout from the community was high, including 28 residents and business owners, and 13 staff including two City Councilors. Chet Bigelow of Sewall, Andrew Johnston of SMRT, and City staff outlined aspects of the watershed planning effort. A draft Plan is anticipated by the end of 2009.

D. Seek funding for implementation of LID treatments for Airport conveyance systems.

Bangor sought and was awarded approximately **$1.7Million** in ARRA Stimulus Funding through the SRF loan program to design and construct several water quality improvement projects at Bangor International Airport in the Birch Stream watershed. Design and construction of these projects are anticipated to occur in the fall of 2009. The projects are listed below:

International Canal System Upgrade

Install gabion and stone check dams along channel to isolate sediment accumulation, install aeration pond to increase rate of glycol decomposition and increase dissolved oxygen. Replace outlet structure to utilize overflow wetland area.

Domestic Canal Channel Improvements

Replace outlets and add sedimentation berms to isolate sediment and dissipate energy into canal. Retrofit downstream discharge outlet to create narrow, meandering stream channel with stone through-flow weirs to dissipate energy and reduce area of surface water, and reducing temperature.

Subsurface Flow Wetland Treatment Train

Change existing twin waterways into active subsurface flow wetland treatment systems with aeration modules that will speed the breakdown of propylene glycol, reduce dissolved oxygen, absorb pollutants, and lower temperature of discharged stormwater from one of the most critical areas of the airport. Reroute piped discharge directly to stream to avoid detention.

Reform Wet Pond to Dry Pond and Wetland

Replace outlet of pond to create a meandering stream channel with overflow protection to reduce temperature. Add wetland pockets to increase pollutant removal and create access ramp to provide easy maintenance of weir structure.

Godfrey Blvd. Bio-retention System

Construct bio-retention system at gateway entrance to airport in the middle of a four lane approach. Stormwater will be treated through the infiltration system, and the entrance to the airport will be made more aesthetically pleasing.

E. Construct Fleet Maintenance Oil/Water Separator and increase spill storage capacity.

Two oil water separators were added to the Fleet Maintenance facility in Permit Year 1. One of the separators which is located near the fueling kiosk was built with a capacity to capture 900 gallons of spilled fuel. The total cost of the project was about $15,000 with labor provided by the City Public Works Department.

F. Promote development of one or more "Business Friends" to adopt "Yardscaping Practices" that promote chemical-free landscaping.

The City worked with the Cooperative Extension Service and the Penobscot County Soil and Water Conservation District under a grant funded pilot project to recruit Business Friends and develop Yardscape plans for their facilities. Facilities in the Birch Stream watershed with the largest green spaces were targeted. The intern that was executing the program found that many of the facilities performed their own landscaping and did not hire out for those services, which will likely make it easier for them to implement recommended changes. Fourteen businesses were contacted by the program intern, and seven of them agreed to work with the intern.

G. *<u>In addition to those items mentioned in the Permit</u>, the staff at Bangor International Airport investigated several new stormwater pollution control technologies and the evaluated the potential for additional treatment these technologies might offer.*

Floating Islands International company donated a 64 sq. Ft. Island to BIA for a survivability study in their waterway, with our natural plant life and in our weather conditions and this is its second year of life here. The island is doing well although ducks take a heavy toll on the vegetation if you do not net it. Past testing data from the company indicates the islands will help the waterway with nutrient loading and suspended solids as well as temperature issues if enough islands are used to provide sufficient cover. The company also claims that 250 sq. ft. of island provides the same treatment benefits as 1 acre of wetland.

BIA is performing testing of a smaller version of the island to determine its ability to digest propylene glycol. The Facility manager from EMCC was provided a tour and demonstration of the floating island and has since determined to also purchase one for their ponds areas.

BIA is also experimenting with a product called Moleculoc. This is a spill cleanup product which will cleanup oil, glycol, Potassium Acetate, by encapsulating the targeted chemical. This product is made from volcanic rock mixtures so it is a natural product and the vendor claims it will remover sheen from the water in a floatable version he has called Sea-Scrub. BIA is attempting to assist the vendor with experiments that will determine if a filter version of this product is capable of removing trace amounts of PG (1-2%) from storm water runoff.

END OF REPORT